

A RESOURCEFUL ASPIRATION: UNDERSTANDING THE GOVERNMENTALITY OF ZERO WASTE IN SCOTLAND

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Abstract

This thesis is about Zero Waste governance in Scotland. The thesis has three aims: empirically, it seeks to develop an understanding of the Scottish Zero Waste policy; theoretically, it aims to critically assess this policy in relation to Governmentality for Sustainable Development; and methodologically, it investigates the use of governmentality as an analytical framework through which to understand governance of complex sustainability issues.

The thesis argues that existing studies of Zero Waste have limited engagement with social theories. It is suggested that governmentality offers a potential theoretical framing through which to better understand Zero Waste governance. The thesis develops a process to critically evaluate Zero Waste governmentalities in comparison with a prescriptive Governmentality for Sustainable Development.

Using a Sustainability Science approach, the thesis adopts a pluralist methodology in which multiple perspectives are valued in both data collection and analysis. Using a framework developed from empirical data and academic studies, data from expert interviews and policy documents is used to construct an understanding of Zero Waste policy in Scotland.

The thesis found that Zero Waste in Scottish policy is understood as a tangible goal and a philosophy of resource use. Innovative governance techniques to promote Zero Waste are identified within policy. It is argued that the Zero Waste policy in Scotland presents a new form of governmentality. It is suggested that this governmentality has the potential to align with Governmentality for Sustainable Development. However, it is found that the strong transdisciplinarity envisaged as part of Governmentality for Sustainable Development is lacking in Zero Waste governance. This thesis considers the role of post-normal techniques in Zero Waste and evaluates and promotes the use of governmentality as a way to develop the strong transdisciplinarity missing from the Zero Waste policy in Scotland.

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Abbreviations

CDM	Clean Development Mechanism
CRNS	Community Resource Network Scotland
EFW	Energy from Waste
EMF	Ellen MacArthur Foundation
EWI	European Waste Hierarchy
RES	Resource Efficient Scotland
SEPA	Scottish Environmental Protection Agency
ZW	Zero Waste
ZWSVP	Zero Waste Scotland Volunteer Programme

1 Zero Waste in Context: An Introduction to the Thesis

1.1 Introduction

“Dealing with waste sustainably is fundamental to the future of Scotland and the future of the planet...there is much more we need to do if we are to truly make a difference locally and globally and today we are setting out our new waste policy to make Scotland greener and a world-leader on waste management”

(Richard Lochhead, Scottish Government, 2008a)

The task of managing waste is global and ubiquitous. Concerning individuals, organisations and governments, society is confronted on a daily basis with the problem of materials we no longer want. As the world becomes simultaneously wealthier and more populated, so this problem increases: by 2025 it is estimated that globally 6 million tonnes of solid waste will be produced every day, almost double 2010 waste production levels (Hoornweg et al. 2013). With forecasts of increasing levels of waste the question of how best to manage this problem becomes ever more prevalent.

Poorly managed waste can have environmental, social and economic consequences. The reduced availability of key virgin resources for future use is an increasing concern, however, leachate and small particles also pollute groundwater, soil and air causing major public health issues (World Bank, 2012). Waste can clog waterways causing flooding (Hoornweg et al. 2013) and pollute oceans and seas: marine debris is now so prevalent that it is collecting in a number of large gyres known as “The Great Pacific Garbage Patch” (Kaiser, 2010). Waste also accounts for approximately 5% of greenhouse gases (GHG), with the majority of its contribution attributed to methane released from biodegrading materials in landfill (World Bank, 2012). As the quantity of solid waste increases, so does concern for those tasked within managing the problem and growing attention is being placed on the often squalid working conditions of people who deal with the world’s increasing waste (ibid). Managing waste is also expensive, not only locally in terms of direct costs to municipal budgets, but also to the potential loss of resources to the global economy (ibid).

In response to these issues, across continents, governments (both local and national) and communities are adopting initiatives and policies to address the perceived failure of traditional waste management methods to deal with the increasing levels of waste. These approaches are often labelled Zero Waste (ZW) (Greyson, 2007, Royte, 2005; Connett, 2013; Zaman, 2015). Krausz (2012:1015) describes ZW as “an alternative philosophy for people searching for better solutions”. A concept that originally emerged from civil society, the term is generally understood as suggesting that “human systems should emulate the rest of nature by only producing wastes that can be recycled into new resources” (ibid). However, in specific contexts the definition is widely applied; ZW can cover waste prevention, waste minimisation, improved recycling, anti-incineration and ZW to landfill (Connett, 2013; Zaman, 2015).

One of the challenges facing advocates of ZW is that despite the consequences of poorly managed waste, and the argument that “rubbish is being generated faster than other environmental pollutants, including greenhouse gases” (Hoornweg et al. 2013:615), knowledge about waste is limited. Not only is this an issue about the lack of available quality data on waste generation (World Bank, 2012) but also the poor understanding of terms, processes and different definitions which make waste a difficult problem to talk about (ibid). As a consequence, de Coverly et al. (2008:290) argue that “our disposal habits go relatively unchecked” suggesting that “while there have been numerous studies of waste commissioned by waste management authorities, these rarely find their way into public or academic domains”. The absence of waste is particularly noted in sociological studies. Scanlan (2005:9) argues that waste is “mostly overlooked in what we take to be valuable from our lived experiences and crucially in the way we organise the world”. O’Brien (2011:5) claims that waste has been “consigned in social thought” to the “intellectual dustbin”.

On the other hand, a smattering of scholars has chosen to focus on the sociological consequences of waste. They argue that although society creates waste (Packard, 1960) that waste also organises society (O’Brien, 2011). Waste has consequences for understandings of the political economy (O’Brien, 1999) in that it shapes conceptualisations of value (Crewe, 2011, Scanlan, 2005; Thomson, 1979) and defines “who we are” and “how we should be in the world” (Hawkins, 2008:5). Waste is, therefore, argued to be so much more than “what we want to get rid of” (ibid:vii).

However, these scholars would also probably concede that they hold a minority view, and that within general society most would see waste as “ephemeral” and as “something that can be disposed of” (O’Brien, 2011:4).

ZW has been described as “a worldwide philosophical movement dedicated to rethinking the very idea of waste” (Krausz, 2012:1015). Through reconceptualising waste as a resource, rather than a valueless material for disposal, in the ZW philosophy the concern is no longer how to manage waste but how to eliminate it (Davies, 2008). If, as scholarship suggests, waste shapes society, it is sensible to suggest that ZW as a reconceptualisation of waste, it might also encourage reflection on other areas of society. This thesis investigates whether ZW is a concept which encourages us to think differently about governance. This shift requires that attention be paid not only to the acts of disposal and collection of waste but also practices of design, production and consumption: ZW is a “whole systems approach” (Curran and Williams, 2012:3)

Empirical studies of ZW policies have looked at policy strategies and interventions at a community level (Mason et al. 2003); city level (Zaman and Lehmann, 2011); municipal level (Zotos et al. 2009; Clay et al. 2007; Phillips et al. 2011; Cole et al. 2014); national level in developing countries (Matete and Trois, 2008) and very briefly at a regional level (Curran and Williams, 2012). Recent syntheses of this work suggests that these studies can act as “an important to guide” to “promote the zero waste practices within all sectors of society” and concludes that “countries may be able to achieve ZW goals by developing a national ZW strategy and by integrating and promoting ZW initiatives (in communities and industry) in waste management policy” (Zaman 2015:23). At the moment no studies have considered the practical implementation of ZW policy at a national level in a developed country. This thesis investigates the strategic goals, techniques and practices of ZW policy at a national level by considering the ZW policy of Scotland.

Through the empirical case of ZW in Scotland, this thesis presents insight into the contested definition of ZW in a policy context, showing that the term has developed as both a philosophy of resource use and a quantifiable goal. The thesis describes the interventions that have been implemented as part of the ZW policy and explains how these actions suggest a new way of governing waste in Scotland. The concept of

governmentality is used to make further sense of these empirical observations. In this thesis, a governmentality study is broadly taken to mean a study that identifies the rationales behind governance practice. The governmentality of a governing act is the underlying rationale for choosing a particular practice or technique to achieve an identified goal. The thesis uses governmentality to consider the empirical observations and extrapolate the rationales of governance underpinning the ZW policy. These rationales are used to consider whether ZW encourages a different way of thinking about governance.

The empirical and theoretical findings of this thesis are intended to contribute to existing academic literature on waste governance, environmental governmentality and characterisations of ZW. However, the study also aims to be societally relevant and so uses a Sustainability Science methodology. This approach aims to create knowledge for practical application towards sustainable transitions, driven by problems identified from within society. In an effort to understand ZW as a sustainable solution to waste management problems, the governance rationales for ZW identified in Scotland are compared with the governmentality proposed as relevant for sustainable development (Governmentality for Sustainable Development (SD) (Frame and Bebbington, 2012)).

This thesis is developed using perspectives from three contexts: the empirical, the conceptual and the methodological. Although, by necessity, these will be addressed in a linear process, these contexts reflect and reinforce each other, and so an appreciation of each is required to understand the thesis. This introductory chapter offers insight into the empirical context by briefly describing the emergence of the ZW policy in Scotland. Secondly, the conceptual context is presented, offering further details on the key terms and ideas used within this thesis. Finally, the methodological context is explained by giving a brief introduction to Sustainability Science. This introductory chapter concludes with a presentation of this thesis' aims and an explanation of its structure.

1.2 Identifying the Problem: Societal Context

In 2010 Scotland adopted a national Zero Waste strategy, the policy aimed to make Scotland a “world leader” in waste policy (Scottish Government, 2008a). This marks a remarkable shift in perspective (Tainsh, 2011): in 2001 Scotland recycled just 4% of its municipal waste (SEPA, 2001) making it amongst the worst nations in the EU for recycling and gaining it the title “the dirty man of Europe” (The Scotsman, 2008). Although introduced at a time when Scotland’s recycling rate had increased to 30% (SEPA, 2008a), the Zero Waste Plan (the ZW Plan) (Scottish Government, 2010a) aimed to go even further and set the target of recycling 70% of Scotland’s waste by 2025, with only 5% going to landfill: one of the most ambitious waste diversion targets in Europe.

The ZW Plan is one of a cohort of policies created by the Scottish Government in recent years that have sought to make Scotland a world force in sustainable development (SD). In 2005, Scotland produced its first SD strategy “Choosing Our Future” (Scottish Executive, 2005); however, the nation only began to make headlines in 2009 when the Scottish Government announced a commitment to cutting carbon emissions by 42% by 2050: the highest target amongst any nation state at that time. Legislation (Climate Change (Scotland) Act 2009) also legally bound the Scottish Government to reduce carbon emissions by 80% by 2050, an equally impressive goal. Although questions have been raised about the focus on the low-carbon economy as a key element in Scotland’s national SD plans (Ross, 2012), the Scottish Government presents ‘Greener Scotland’ as a clear objective requiring the involvement of all society.

This involvement is encouraged from an early stage of policy development through the extensive use of consultation processes for environmental issues. The ZW Plan was also subject to input from all sectors of Scottish society through such a process. In March 2008, Richard Lochhead, Cabinet Secretary for the Environment announced the creation of the ZW Think Tank with representatives from academia, waste industry, local authorities and national government. The outputs of the ZW Think Tank were used to create a draft ZW strategy which went to public consultation between September – November 2009. The final ZW Plan was published in June of the following year.

This thesis considers the development and implementation of the ZW policy over a seven year period from January 2007 to December 2013. As well as the national strategy the ZW policy has introduced a number of other actions including: the creation of a specialist delivery body Zero Waste Scotland (ZW Scotland); development of a business focused initiative Resource Efficient Scotland (RES) and community oriented Zero Waste Volunteer projects; as well as the introduction of a quality assurance scheme for reuse items (Revolve). Some of these policy interventions offered new styles of governance for waste management and this research project found that questions were raised about the purpose of these interventions. This finding suggests that governance of ZW is somewhat opaque for actors both within and outwith the regime.

There are no studies of waste governance in Scotland. Nor was there readily accessible literature through which to build an understanding of the waste as a policy problem, the actors involved in waste policy or policy interventions in Scotland. Some studies purport to offer analysis of waste within a UK context (i.e. Phillips et al. 2006; Tudor et al. 2011); however, they focus exclusively on English policy which is often notably different from the Scottish context (Cole et al. 2014). Consequently, this thesis should be seen as an exploratory study into the governance of waste in Scotland as well as an investigation into ZW policy.

McCrone (2001) suggests that Scotland offers a unique political context; it is neither a state nor society, it has its own key institutions (legal, educational and religious) and defining something as Scottish, McCrone argues, can be an inherently political act. This is pertinent in waste studies, where historical circumstances have meant that since at least 1996 and the creation of the Scottish Environmental Protection Agency (SEPA) Scotland has adopted its own environmental legislation and regulation, including the Scottish National Waste Strategies (Scottish Executive, 2003; Scottish Government, 2010) and it has been claimed the most recent national waste strategy ('the ZW Plan') is far more "ambitious" than its English counterpart (Cole et al. 2014:69). Moreover, since 1998 Scotland has been responsible for a number of devolved issues in the Scottish Parliament that are central to the governance of waste, including the environment, health and social services, economic development and local government.

Despite the importance of a Scottish waste context, the research on waste in general in Scotland is piecemeal and strewn across a number of disciplines. It is possible to identify small clusters of research: the effects of litter in the marine environment (i.e. Storrier et al. 2007; Harrison, 2003; Velander, 2003); social justice issues and landfill (Dunion 2003; Richardson et al. 2010; Morris, 2003); and household recycling (Collins et al, 2006; Asif et al. 2007). None of these studies were deemed applicable to understanding ZW governance within Scotland. As a consequence the supporting academic literature for this thesis had to be drawn from other sources.

1.3 Understanding the Problem: Academic Context

As will be explained in Section 1.4 (p23) of this chapter, the process between identifying and understanding the problem in this thesis was iterative, with investigations into literature being driven by initial understanding of the empirical context. Through these investigations it was possible to ascertain potential contributions that will emerge from this thesis, but the research project was not motivated by gaps in the literature. As a consequence this section will focus on clarifying the key concepts used in this thesis. Where identified, limitations of the constructions of these concepts in existing literature will be discussed. These should be taken as the academic contributions of this thesis. The concepts discussed in this section are zero waste, governance, governmentality and sustainability.

Zero Waste

Despite evidence of its use in civil society and policy from the early 1990s (Zaman, 2015; Connett, 2013), the concept of ZW did not begin to take off in academic literature until the late 2000s (Zaman, 2015). A recent review article by Zaman (2015) finds that the concept has come to be used in a variety of ways in scholarship and it features in articles on all stages of the production process (from extraction to waste disposal) and across all continents. Nevertheless, the article finds that the concept is “still in development” (p19).

The literature review conducted in this thesis also found the term ZW had been used to identify a variety of practices, processes and policies. Although some of these conceptualisations of waste appear contradictory: for example ZW is often linked to

anti-incineration practices in society (Davies, 2008; Connett, 2013) but less so in policy (Zaman, 2015) research has yet to identify conflicting definitions of ZW in an empirical context. As a consequence, whilst the term is widely presented in the literature as a political challenge to existing waste management practices, there is little attention paid to how a chosen definition of the term could also have political implications within a given context.

This research project did not adopt a definition of ZW but instead sought to understand it from the empirical perspective of ZW policy in Scotland. This thesis argues that ZW can exhibit a range of definitions within one policy context. This can cause confusion, present contradictions and so have consequences for the influence of the policy. One of the potential reasons for the absence of a discussion of ZW in waste literature is that, so far, the concept has not been subject to detailed analysis from a governance perspective.

Governance

Governance is a ubiquitous but contested concept within environmental studies (Davies, 2008; Jordan, 2008). This thesis adopts Davies' (2008:16) definition of governance "as the manner in which issues are governed and the respective roles and responsibilities of actors and institutions in practices related to that governing". Importantly governance is not necessarily connected to *the government* and actors can be "businesses and non-governmental organisations" (Jordan, 2008:21) The investigation of the move from state centric to more diffuse governing practices is a central concern for some governance literature (Davies, 2008); however, governance as an "empirical phenomenon" (Jordan, 2008:22) is not the direct concern of this thesis.

Similarly it has been noted that governance is often used as a prescriptive normative concept in which specific practices should be undertaken in order to reach a certain goal (Jordan, 2008). For example, Holley et al. (2012:4) suggest that environmental governance is "collaboration between a diversity of private, public and non-government stakeholders who, acting together towards commonly agreed (or mutually negotiated) goals hope to achieve far more collectively than individually". Many of the processes they identify (participatory dialogue, decentralised decision-making, knowledge generation etc.) are discussed in some form in this thesis where a description is given of how they emerge in practice in relation to ZW.

This thesis links most to a third use of the term governance – what Jordan (2008) describes as governance as theory. In this sense the thesis aligns with the governance research of Bulkeley et al. (2007), which Davies (2008) has suggested is scholarship that is most interested in “‘how’ governance works” (p33). For Bulkeley et al. (2007) the art of government is a constant problem-setting and solution-seeking process. This is a complex process that involves a variety of actors, techniques and scales. It is the understanding of these interactions and the focus on governance as the processes of governing that is central to this thesis.

A number of studies have considered waste from a governance perspective. Focus has been almost exclusively on municipal waste (i.e. waste collected by local authorities, predominantly consisting of household waste) which although diverse and therefore technical and expensive to collect (Davies, 2008) only presents a small portion of total waste arisings (approximately 20% in Scotland (SEPA, N.D.)). In contrast, it has been argued that ZW on a national level should involve all waste streams (Curran and Williams, 2012). Moreover the goal of ZW has been identified as offering “opportunities for government” (Clay et al. 2007: 786) and presenting “alternative techniques for waste governance” (Davies, 2005:385). Consequently this thesis provides insight into ZW from a governance perspective, and insight into waste governance from a ZW perspective. As a way to make sense of governance in the ZW policy, this thesis adopts the concept of governmentality which has also been used by others to understand waste governance (Davies, 2008; Bulkeley et al. 2007; Hird et al. 2014). Governmentality is a concept that is widely used across a variety of literature to understand the links between ideas and practices in complex governance problems.

Governmentality

Governmentality starts from the premise that modern governance is a product of the reinforcement of societal norms by citizens and institutions rather than the influence of one central power (Ettinger, 2011). It is argued that these societal norms are constructed, reinforced and resisted through knowledge. In this thesis governmentality as a means to understand governance is based on the idea that by recognising how knowledge is used to govern environmental problems we can identify the rationality

behind modern governance practices of environmental issues (Agrawal, 2005). These rationalities are described as governmentalities.

It is argued that identification of governmentality provides an extra layer of understanding of governance of an issue. Going beyond the identification of governance techniques and governance goals, governmentality allows the identification of the thoughts which link these techniques and goals. The identification of the ideas behind governance practices focuses attention on *how* society is governed rather than *by whom*: the former being a more pertinent question from a governance perspective where power is more diffuse.

Governmentality has been used to understand the governance of environmental issues in a number of different ways. These have been categorised in this thesis as Ecogovernmentalities, Environmentalities and Governmentality for Sustainable Development (Governmentality for SD). These approaches are described in detail in Section 3.3 (p72) where it is argued that, if used together to understand ZW policy in Scotland, these categorisations can offer a fuller perspective on governmentalities within the ZW policy. Concisely, Ecogovernmentalities offer a link to identified governmentalities in existing studies of governance of the environment; Environmentality offers the opportunity to find new understandings of governmentality in the particular context; and Governmentality for SD allows comparison of these governmentalities in relation to the requirements of governance for SD.

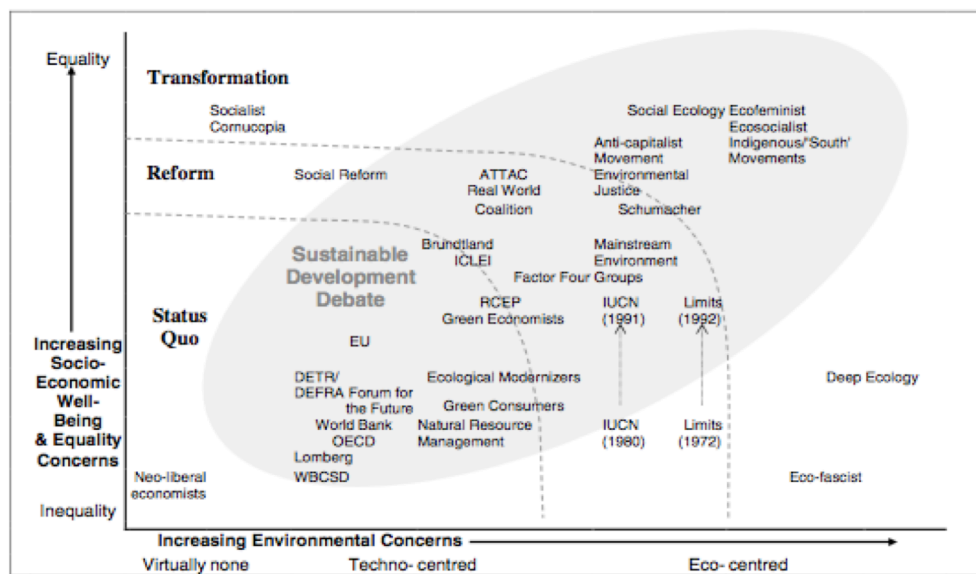
This final step is an important contribution of this thesis: rarely do governmentality studies attempt to direct governance, and yet, it has been argued that governmentality offers potential insights into governance, which could be put in practice to encourage sustainable development (Frame and Bebbington, 2012). In order to understand this conceptualisation of governmentality, it is necessary to clarify what is meant by sustainable development in this thesis.

Sustainable Development

There is widespread academic discussion on the meaning of sustainable development (SD). Some believe that it should remain an undefined conceptual goal (Kates et al. 2001) whilst others contend that some consensus of purpose is required to achieve the

objectives of the term (Ross, 2012). Sometimes it would appear that the only agreement in SD is that there is no widespread consensus on the definition of the term (i.e. Jabereen 2008; Hopwood et al. 2005). The definitions vary widely but usually SD can be categorised along a spectrum (See Box 1.1 p22) and the debate can often be seen as turgid and lacking purpose. Although it has been recognised that sustainability must be subject to the analytical thinking of other disciplines, it has been suggested that the inherent value-laden approach to SD research generates a necessity to advocate action as well as critical theorising of the term (Forsyth, 2003).

Box 1.1: Mapping Perspectives of Sustainable Development



(Hopwood et al, 2005:41)

As a consequence, this thesis uses a definition which Hopwood et al. (2005) define as “transformationist” (see Box 1.1 p22). Transformationists “see mounting problems in the environment and/or society as rooted in fundamental features of society today and how humans interrelate and relate with the environment” (ibid:45). Transformationalists form a broad church but as a general rule are concerned with both environmental protection and social change. This definition of SD is somewhat lacking in that it neither identifies the “mounting problem” nor what future it sees for this transformed society (ibid:43). This thesis adopts the perspective that these questions are too large to be answered by an individual researcher and so it takes a methodological perspective in

which the identification of the sustainability problem, solution and goal comes from a societal context.

1.4 Investigating the Problem: Methodological Context

Building a picture of the societal context of the problem prior to identification of appropriate literature is an important feature in the methodological perspective of this project. This thesis adopts a Sustainability Science approach in which research is problem-driven and solution-oriented (Jerneck et al. 2011). This type of scholarship uses a sustainability problem to frame and shape the research design. The problem should be of interest beyond an academic context and the research should endeavour to contribute to knowledge that has a societal impact on transitions towards sustainability (ibid).

Linked to methodological perspectives such as post-normal science, transdisciplinarity and Mode 2 research (Brandt et al. 2012), Sustainability Science begins from the premise that disciplinary research is too narrowly focused to understand the complex systems in which sustainability issues occur; this makes it difficult to identify solutions to sustainability problems from a single disciplinary perspective. In an effort to understand these complex problems, Sustainability Science uses an approach which this thesis terms methodological pluralism: a combination of the positivist science of environmental limits and critical perspectives on sustainable solutions. This pluralism also extends to epistemological considerations and Sustainability Science values understandings from multiple perspectives particularly on the identification of the problem and framing of a sustainable future.

Sustainability Science often suggests that these multiple perspectives can be obtained by conducting participatory transdisciplinary studies in research teams (Lang et al. 2012). This thesis argues that this presents a difficult task for a PhD project focusing on national policy. Therefore a compromise was sought where this thesis follows the process for transdisciplinary research, using multiple forms of knowledge to frame the problem, investigate the problem and propose solutions, and to evaluate the findings and process, but the knowledge of non-academics is gained through consultation rather than participation (Mobjörk, 2010). Each of these phases involved reflexive

consideration of the aims of the thesis based on empirical data, academic literature and, latterly, findings from this thesis. These aims and the thesis structure are outlined in the next section.

1.5 Thesis Aims and Structure

This thesis has three aims, each of which relate to a phase of the research project. These aims were refined and constructed throughout the project, however, all stemmed from the overarching research objective of creating an understanding of the governmentality of ZW in Scotland. In addition each of these three aims relates to an empirical, theoretical and methodological contribution.

Phase A: “Framing the Problem” contributed empirical findings and focused on the first aim of this thesis: *to develop an understanding of Zero Waste policy in Scotland*. To achieve this aim, two research questions were investigated:

- 1) How is the policy goal of Zero Waste *understood* in Scotland?
- 2) How is the policy goal of Zero Waste *pursued* in Scotland?

Phase B: “Investigating the problem and identifying solutions” built upon the findings from the first phase to contribute to the theoretical theme of this thesis. The aim in Phase B was: *To critically assess the governmentality of the Zero Waste policy in Scotland in relation to Governmentality for Sustainable Development*. It was also driven by two research questions:

- 1) What is the rationale behind the implementation of Zero Waste policy in Scotland?
- 2) How does the rationale of ZW governance compare with Governmentality for Sustainable Development?

Phase C “Evaluation” sought to critically evaluate the findings from the first two phases and the final aim of the project was: *to investigate governmentality as an analytical framing through which to understand the governance of zero waste in Scotland*. This phase contributed to methodological discussions and was achieved by assessing the

credibility, salience and legitimacy of the research findings, thus applying recognised criteria for evaluating Sustainability Science (Miller, 2013).

This thesis is structured to roughly narrate the research process; however, it is difficult to present the role of reflexivity on shaping the research strategy within that format and so the account of the process is more linear than the research in practice. The following description of the thesis structure attempts to show the reflexivity and relationship between the empirical, methodological and theoretical themes of this project.

Chapter 2 of the thesis (p27) presents the literature review on waste, ZW and waste governance. The review uses both grey and academic literature. This is intended to contribute to the empirical findings of this thesis. The findings that relate to the empirical context of this thesis, and Phase A “Framing the Problem” can be found in Chapter 5 (p134). This chapter explains how the goal of ZW is understood and offers insight into the interventions that have emerged under the ZW policy. The chapter concludes that ZW has marked a shift towards more sustainable waste governance.

These findings emerged through the Framework for Analysis which has been created using the concept of governmentality. Chapter 3 (p61) presents a review of governmentality as used in this project. The chapter clarifies key terms, explains how environmental governmentality has been understood and used in existing literature and presents how it is used in this thesis. In particular, there is a focus on the explanation of the structured application of different approaches to understanding the governmentality of environmental issues. This allows both consideration of the particular context of the ZW policy and allows the findings to contribute to solutions for sustainable transitions. Continuing the theoretical theme the process and findings from this part of the research project are presented in Chapter 5 (p173). This chapter of the thesis finds that a number of governmentalities are present in ZW policy, including those linked to both advanced-liberal governance and SD governance. It is argued that to promote the latter, the ZW policy should develop more post-normal techniques of governance.

This link to solutions is an important feature of the methodological theme: Sustainability Science. This theme holds the thesis together and elaboration on the goals, techniques and underlying philosophical tenants of Sustainability Science can be

found in Chapter 4 (p100). This chapter also outlines the research methods and strategy in more detail. These methods and strategy are critically evaluated in Chapter 7 (p213), the final chapter of the thesis. This chapter reflects on the findings of the thesis, discusses the thesis limitations and identifies areas for future research. It concludes that the thesis has met its aims and objective.

2 Making Sense of the Dispersed and Diverse Literature on (Zero) Waste

2.1 Introduction

“Ours is a culture and a time immensely rich in trash as it is in treasures. Sometimes it is a little hard to tell the trash from the treasure, so we hold back, afraid to declare ourselves. But since we are out to give ourselves texture, to collect truths on many levels, and in many ways, to test ourselves against life, and the truths of others... we should not fear to be seen in strange companies” (Bradbury, 1996:39).

This chapter provides an overview of the existing scholarship on Zero Waste (ZW). Numerous studies suggest that finding a solution for waste problems requires multiple perspectives, both within and outwith academia. Moore (2012:14) calls for “interdisciplinary engagement” whilst Curran and Williams (2012:3) advocate that achieving ZW will require a “network approach”. Lehman (2011) argues that optimising ZW requires a combined effort of industry, government bodies, university researchers and community and Seadon (2010:169) suggests that sustainable waste management systems will require “transcending paradigms”.

This chapter claims that ZW research, particularly from a governance perspective, is in its infancy. As a consequence, this literature review also extends its scope to the consideration of the concept of waste and waste governance. Lehman (2011:157) notes that waste is a global issue that “transcends boundaries and disciplines” and Moore (2012:1) suggests that its use as a “lens” by various disciplines renders waste an ideal concept to reframe issues. Regardless of this utility and its obvious ubiquity, it has been noted by various sources that waste remains under-researched (i.e. Hawkins, 2006; Scanlan, 2005; Davies, 2008). Therefore, constructing a coherent comprehension of waste requires consideration of a broad range of disciplines and fields of study.

There is clear compatibility with adopting a Sustainability Science methodology to understand waste; however, very little guidance exists on how to undertake a literature review that complements this approach. Gaziulusoy and Boyle (2012:p3-4) suggest that

in choosing the literature to answer interdisciplinary research questions, a researcher should focus on three key goals i) “positioning the need for knowledge with references to the problem needing to be addressed” ii) “the researchers knowledge, base skills and internal motivation” and iii) “the institutional set-up”. Mitchell and Willet (2009:17) suggest that a transdisciplinary literature review should involve “critical, pluralistic, engagement with appropriate literature, artefacts, the research context and multiple stakeholder perspectives within it” but also acknowledge that the research should synergise across various areas to create an “original and creative contribution to knowledge and/or practice” (ibid).

As a consequence, rather than choosing an academic discipline or field of scholarship, the literature for review was selected for its relevance to this thesis. It draws from a variety of sources but it focuses on guidance for conducting waste research, conceptualisation of ZW and understandings of waste governance. These choices were driven by the societal development of ZW as an aspirational goal; the researcher’s existing knowledge and the relative depth of governance scholarship as an area of waste research. There is a lack of interaction between these three bodies of literature and so much of the review involved extrapolation of common links rather than identification of key debates. In a broad sense this chapter’s structure can be summarised as identifying the problem of waste, investigating the solution of ZW and considering how to achieve that goal through waste governance.

The chapter begins by presenting waste as a general concept and explores discussions of how the term should be researched. The second section of the chapter discusses the definition of ZW and focuses predominantly on scholarship that uses this term directly. Finally, the third section of the chapter considers waste governance in connection with ZW studies. It offers an overview of the limitations of both the theorisation of ZW governance and the application of governmentality of waste and suggests that this thesis will contribute to both these areas.

2.2 Practice, Culture and History: The Definition of Waste

There is no consensus in the literature on what waste means. It is a subject with fuzzy boundaries and it has been argued that waste, rubbish, garbage and various other terms

associated with discard should be viewed with nuance (Hetherington, 2004; Scanlan, 2005, Rathje and Murphy, 2001). This ambiguity extends beyond academic knowledge and it has been noted that within society uncertainty exists on when to call something waste (Lucas, 2002), how to deal with waste (Henriksson et al. 2010), how to value waste (Reno, 2009) and what happens to waste when it leaves our homes and businesses (Hird et al. 2014).

Cultural and anthropological studies are considered the most developed disciplinary knowledge on waste (de Coverley et al. 2008) and so the literature review focused predominantly on these areas of scholarship. Additional information was taken from history, geography and sociological literature. This section addresses three aspects of waste; the complexity of discard practices; the importance of contextualisation; and the development of waste as a societal problem for governance. It is suggested that whilst these represent key discussions within waste literature, they have not been explicitly addressed within ZW scholarship. It is contended that awareness of these aspects can provide additional insight into ZW governance.

2.2.1 Complexity of Discard Practices

Watson et al. (2008:486) suggest that sustainable waste management follows a shift from a “disposal paradigm” to “waste as a resource paradigm”. This framing reflects Lucas’ (2002) claims that waste analysis often focuses primarily on material flows. Instead, he argues, we should recognise that waste is “entangled in the moral system of hygiene and thrift” (p7) which goes beyond the delineation of material waste portrayed by legislation and public policy.

Hetherington (2004:159) also claims that waste “suggests too final a singular act of closure, one that does not actually occur in practice”. He argues that disposal is an “epistemology” in that it indicates what and how we choose things that fit within our ideas of order (p163). He suggests that we focus on motivations for consumption but ignore the practice of disposal. Supporting this view, in their study of uncertainty in recycling practices, Henriksson et al. (2010: 2807) argue that waste management is culturally defined by practices of “visibility, value, shame/pride, purity, disgust and satisfaction”.

Bulkeley and Askins (2009) have also highlighted the disconnect between policy and discard practice. In their study of biodegradable household waste they found that there was little interaction between the public policy of dealing with the waste efficiently and economically and the private practice of discard in the home. They argued that the policy needed to consider that “waste is conceived, treated and disposed of through different social and community networks” (p259). This finding compliments that of Clay et al. (2007:786) who suggested that the focus of policies for sustainable consumption and production should not be “primarily about improving efficiencies”.

If, as Philips et al. (2006:262) argue, “the key to sustainable waste management is reduction of waste at source” then an open understanding of the concept of discard is important for any ZW society. Bulkeley and Gregson (2009) suggest that current focus on municipal waste puts too little emphasis on collection and does not deal sufficiently with understandings of waste generation. They argue that current policies have done nothing to “alter the understandings of discard as waste” (p942). They suggest that policies should take note of existing practices before “imposing” behaviour change interventions (p943).

None of this nuance is evident from existing ZW literature. Barriers to ZW are usually identified as material constraints rather than process issues (i.e. Lehmann, 2011, Geng et al. 2012) with key strategies focusing on design, technology and legislation (Curran and Williams, 2012). If a ZW policy is attempting to shift from waste management to waste as a resource it must take into account the complexity of discard. As a consequence, the policy should not only be concerned with waste as a final act but also the process of producing and labelling materials as discards.

2.2.2 The Importance of Context

Empirical studies of ZW policy include research in Asia (Young et al. 2010), Africa (Matete and Trois, 2008), Australasia (Clay et al. 2007; Zaman, 2014a; 2014b), the USA (Murphy and Pinceti, 2013), and Europe (Zotos et al. 2009; Philips et al. 2011, Cole et al. 2014). This reflects Davies’ (2008:57) insight that there is a “surprising commonality” in global use of waste terms. Despite the widespread use of the ZW

concept, this should not be taken to mean that understandings of practices of waste manifest in the same way in these contexts; the materiality of waste has meant that various sources have maintained the importance of context in any waste management study.

Some studies have suggested that context is important because the acceptance and cooperation of local stakeholders is essential to any waste policy (Bull et al. 2010; Davoudi and Evans, 2005). Entwistle (1997) argues that trust in waste regulation (and policy) relies on three components: purpose, processes and values. He suggests a common purpose and culture encourages shared responsibility and shared goals. Hetherington (2004:171) argues that the values inherent to waste include “issues of social membership, recognition, order, acceptance, status, honour, and self-worth” and Henriksson et al. (2010) have found that the cultural aspects of waste are particular rather than universal.

Others have argued for the importance of context to fill gaps in existing waste management knowledge and it has been argued that the local application of waste management policies are frequently ignored (Watson et al. 2008). There has been some suggestion that national and international policies are often subject to most distortion at the local level (ibid) and calls have been made for a more “nuanced understanding” of the interaction between local and national practices and global aims (Gille, 2010:1062). The link between ZW as a global call for alternative resource management and ZW as a national policy objective has yet to be considered in the literature. Deutz and Frostick (2009:248) argue that this is an issue across waste management research where “significant gaps remain between objectives and practices” and they suggest that any “theorizations need to be cognisant of policy and practice” (ibid).

There is a further argument that understanding the complexity of any waste policy requires a contextualisation. In her study of waste governance in New Zealand and Ireland, Davies (2008:161) found that “the policy regimes in both countries were not constructed in isolation from... the social and political changes or cultural and economic contexts”. This not only echoes Davoudi’s (2006) findings that waste strategies require both technical and political knowledge but it also shows the diversity

of components that are at play in any waste management regime. Watson et al. (2008:486) claim that waste regimes can offer “labyrinthine complexity”.

The complexity of waste regimes also promotes the continuation of researching waste in a variety of contexts. The nature of ZW governance in Scotland is likely to be somewhat different to the empirical context of other studies. On the other hand, a series of case studies does little to forward academic understanding of ZW unless some attempt is made to theorise the observations. The contextualized and complex nature of waste governance requires a type of theorization that allows both consideration of the specific and the general. ZW literature has not, thus far, engaged in any meaningful way with a social theory that might make sense of the complexity of ZW governance. As a consequence, it is difficult to make links across existing ZW studies which might be extrapolated to develop policies elsewhere.

2.2.3 Historical Legacies of Waste Policy

In a number of studies it is suggested that context extends to historical waste governance practices (Bulkeley et al. 2007; Nilsson et al. 2009). It is sensible to presume that Scotland’s current waste governance context may include links to previous waste regimes. As there is scant existing research on the history of waste in Scotland, it was necessary to look to the problematisation of waste as a governance issue in similar contexts.

Identification of literature outlining a comprehensive history of waste management practices, whether in a Scottish or other national setting, was difficult to find. Clark (2007a:129) notes that “little research has been dedicated to the historical relationship between waste and the environment in Britain”. It was found that histories of waste were often presented in the literature more as genealogical accounts of the development of waste (i.e. Rogers, 2005; Girling, 2005; Strasser, 1999). Equally some anthropological texts also offered insight into the development of waste as a public policy concern (Rathje and Murphy, 2001; Royte, 2005). Most of these accounts focused on the USA. Nevertheless, it was possible to piece together a storyline of waste as an issue for governance which was deemed a useful starting point from which to base an understanding of waste governance in Scotland.

What follows is a brief overview of the western development of waste policies in the 20th Century. It should be noted that this presentation shows only the development of waste on a general policy level. It has been recognised in a number of studies that the practices of thrift, recycling, reuse and waste removal by incineration have been adopted on an individual and community level for hundreds of years (i.e. Rogers, 2005; Strasser, 1999). The focus of this thesis is not household level practices and so this section gives an account of waste policies. This review is not considered to be comprehensive but instead is used to provide the necessary background knowledge to understand the problematisations of waste as a policy issue in Scotland.

In her social history of trash, Strasser (1999) notes the difference between waste and trash, suggesting that prior to the 20th Century trash (as material waste) was not considered a social problem. This argument has been supported elsewhere. Rogers (2005:31) also suggests that garbage “is a relatively new invention predicated on the monumental technological and social changes wrought by industrialisation”. The urbanisation that occurred during this period is cited as the driver for waste to become a municipal issue (Gandy, 1999, Clark, 2007a). Strasser (1999) notes that whilst public concern for waste in urbanised areas had long been a concern, the increase in population growth of cities and urban areas and the corresponding rise in epidemics and discards, heightened the demand for public intervention. In 1875 the UK adopted The Public Health Act, which placed the emphasis on Local Authorities to remove waste.

Focusing on “cleanliness and rationality” in the late 19th Century city sanitation began to try to eradicate waste (Strasser 1999:119). Clark (2007a) also notes the drive to remove waste from society for sanitation reasons during this period. He suggests the development of mass incineration as a form of public waste removal “represented the application of modern technology to the destruction of discards, rather than the conservation of resources” (p133). It would appear that this hidden aspect of waste management has permeated into recent society and that knowledge of waste management techniques amongst the general public remains limited (Rathje and Murphy, 2001, Hird et al, 2014).

Clark (2007a) states that incineration was not without its critiques and people argued that incinerators were “disproportionately represented” in areas of social deprivation (p131). The link between poverty and waste management has been noted elsewhere (Strasser, 1999). As a consequence it could be suggested that issues of social justice have emerged almost concurrently with the development of waste management as a municipal issue. Today, questions are still raised over the increased presence of waste management facilities in socially deprived areas (Dunion, 2003) and justice concerns have now expanded to include the export of more toxic wastes to developing nations (O’Neill, 2000).

The toxicity of waste and the associated health problems has also been identified as a key driver for waste management policies. It has been recognised that there was widespread public resistance to incineration in response to the high levels of dioxins produced by incineration (Gandy, 1994; Williams, 2005; Rogers, 2005) but equally a number of major pollution disasters in the 1970s also raised questions about the toxicity of leachate from landfill (Williams, 2005). The 1980s saw a raft of new legislation introduced in the UK and EU to control the environmentally polluting effects of waste management.

Williams (2005) also suggests that this period marks the link between waste policy and SD, a move he suggests was largely driven by the EU. Williams (2005:7) notes the development of EU waste management policy from “waste as a remedial problem requiring control at a community level” and the focus on waste was “the sustainable management of natural resources”. This is also reflected in the development of the EU Waste Framework directive. First adopted in 1975 with an emphasis on waste management with respect to health, recent manifestations have emphasised preservation of natural resources and reuse of waste materials (ibid). This has culminated in the adoption of the ‘European Waste Hierarchy’ (EWH) (see Box 2.2 p49) as a normative prescription of how waste should be managed in accordance with SD principles.

Arguably the UK is perceived as a bit of a laggard in adopting recycling as an important aspect of waste management. Whereas recycling rates remained low in all UK nation states until the late 1990s, elsewhere - including in parts of the USA and Europe - many municipalities and governments had adopted recycling policies decades before. Strasser

(1999) notes that in the US much of the promotion of recycling can be attributed to the environmental movement, with many schemes being run on a voluntary basis until the late 1980s where it became apparent that there were economic gains to be made from recycling materials. The economic incentives of recycling have also been noted as a driver for policy elsewhere (Williams, 2005).

Rogers (2005) suggests that the link between the reduction of waste and economic incentives has led to a “corporatisation of waste” in which private organisations have become more involved in the collection and treatment of garbage. In addition, Gandy (1994) claims that the growing costs associated with the increased volume of waste meant that the private sector was looked upon to relieve the burden on local authorities. Rogers (2005) notes that this privatisation has seen an increase in organised crime and waste management. This link between waste management and crime has also been highlighted by others (Dorn et al. 2007).

Waste has also developed as a crime in relation to failure to adhere to environmental regulations. Wolf and Stanley (2011) say that waste regulation is seen as the public regulation of private pollution. This suggests that there is a developing personal responsibility, not only for how much waste individuals produce but also how it is disposed of. This personal responsibility has extended beyond regulation with Strasser (1999:285) arguing that recycling has become for most people “like motherhood and apple pie”.

Others have recognised this link between waste policy and environmental norms. Williams (2005) notes that the development of the EWH was largely concurrent with a more widespread adoption of sustainability principles. A number of texts have associated this with the ZW movement (i.e. Connett, 2013; Royte 2005; Rogers 2005) and whilst questions are still raised, it would appear that there is some link between ZW policies and SD goals. However, the nature of this relationship remains unclear.

ZW is a relatively recent concept in waste management: it has been used as a political term since the early 1990s (Connett, 2013:82). Arguably often a community-driven initiative (Davies, 2009), in recent years ZW has become a popular policy concept for local governments and businesses (Greyson, 2007). ZW is first seen as a defined term

in peer-reviewed scholarship in the mid-2000s (Mason et al. 2003). The next section of this chapter explores in more detail the emergence and discussion of ZW in civil society and academia.

2.3 Policy, Activism and Scholarship: Definitions of Zero Waste

The phrase ZW is found in many sectors of society. Recent work by Zaman (2015) supports the idea that it has come to mean many things dependent on context. Zaman's paper was published late into the development of this thesis (it became available online in December 2014) and so was not used to shape the literature review. Although it purports to offer a comprehensive and critical analysis of ZW, it predominantly uses a bibliometric to focus almost exclusively on academic papers. As a consequence it ignores any political implications of definitions and does not address ZW in civil society. This is an omission: not least because the paper encourages the adoption of national ZW Plans but fails to acknowledge ZW in Scotland at all. Although the findings of the paper support observations made in this literature review, the thesis goes further in seeking to understand definitions of waste by focusing on the potential political use of the term.

This section begins by outlining some background on ZW in western society. The purpose of this is not to provide a comprehensive overview of the development of the term ZW but instead is used to highlight that, outside academia, ZW has been used as an inherently political idea. It is found that ZW has manifested in society in two distinct ways: as a defined policy goal and as a challenge to existing consumption practices.

A review of scholastic understandings of ZW is then given. It was found that most academic literature fell into three camps: those who saw ZW as a change in perspective on waste, those who claimed it as an absolute goal, and those who were critical of both these perspectives. It is suggested that researcher reflection is an important component of waste studies and the definition of ZW used in this thesis is given. Finally the section ends with a brief discussion of the points of difference between ZW in society and ZW as represented in academia. It is suggested that this thesis contributes to scholastic understandings of ZW by investigating it as an inherently contentious issue.

2.3.1 Zero Waste in Society

Beyond a brief timeline in Zaman's (2015) paper there are currently no studies that consider the historical development of ZW. Empirical research using the concept tend to consider the term only within the context of the study site, whilst those studies which look at the idea more generally are rarely linked to ZW as understood outside the specifics of the paper. Nevertheless, the variety and breadth of applications considered by empirical studies suggests that the term has a significant global presence. This thesis does not aim to provide a comprehensive analysis of applications of ZW across the world but this section offers a review of two of the key trends that are apparent from existing empirical studies. The following discussion uses studies of ZW policies in combination with a variety of grey literature to show that ZW has developed quite distinctly as both a policy goal and as a challenge to existing production-consumption systems. This will illustrate the political aspect of ZW which is currently underplayed within ZW literature.

ZW has been a definitive policy goal for almost twenty years. In 1996, Canberra, Australia became the first regional government to adopt a ZW approach in its *No Waste By 2010* strategy (Australian Capital Territory (ACT) Government, 1996) in which they proclaimed to be "the first Government anywhere to embrace such a bold target - of becoming a waste free society" (ibid: p1). The strategy was far reaching and included resource recovery, recycling and calls for reduction in consumption. Links to Canberra encouraged the adoption of ZW policies in the USA and New Zealand (Connett, 2013).

In 2002 the New Zealand Government adopted the *The New Zealand Waste Strategy: Towards ZW and a Sustainable New Zealand* proclaiming to be the first national government in the world to have adopted the ZW mentality. Notably their goal was not quite the same as that proposed by Canberra; in New Zealand issues of limiting consumption were downplayed in favour of focusing on more circular design and resource use (Davies, 2008).

The New Zealand strategy did not define ZW (ibid: 164); however, the ZW New Zealand Trust (a charitable group created to promote ZW in New Zealand society) saw ZW as:

“...waste elimination at source through product design and producer responsibility and waste reduction strategies further down the supply chain such as Cleaner Production [sic], product dismantling, recycling, reuse and composting” (ZW New Zealand Trust in Snow and Dickinson, 2003: 6)

Their definition also gave a clear commitment to avoid both landfill and incineration (ibid) which is argued to be a defining characteristic of ZW philosophy (Connett, 2013).

ZW strategies have now been adopted by cities, regional authorities, companies and national governments all over the world (Zaman, 2015, Greyson, 2007; Royte, 2005; Connett, 2013). However, questions have been raised as to whether the policies adopt the ZW philosophy proposed by the earlier programmes. Townend (2010) suggests that ZW has been adopted by some governments as a rhetorical phrase which has little or no connection to the absolute goal of ZW. Royte (2005) also notes that those working with the term in a policy context have adopted a variety of definitions.

In their study of ZW in Los Angeles, Murphy and Pincenl (2013) found that despite the city's aim to achieve 90% landfill diversion rates and adopt a *resource* - rather than *waste* - management position, there are still aspects of the city's approach which “exhibit a disconnect with one of its ultimate ecological motivations for ZW” (p49). They found that the city was sometimes more concerned with increasing its landfill diversion rates than the ecological consequences of its choices. Similarly Phillips et al. (2011) found that ZW in England was quite readily linked to minimising waste to landfill and incineration, but often did not exhibit links to a wider waste reduction or resource conservation philosophy.

Elsewhere ZW strategies have been implemented through policy goals to increase recycling rates and total waste generation (i.e. in Victoria, Australia (Clay et al. 2007) and Taiwan (Young et al. 2010)). In Zotos et al.'s (2009) paper on the adoption of ZW policies regionally in Greece, it is difficult to identify what might link the policy targets

of waste reduction to the original goals of the Canberra ZW strategy. It has been suggested in other studies that organisations may become fixated with achieving waste targets (Watson & Bulkeley, 2005; Watson et al. 2008; Clay et al. 2007) rather than adopting a new philosophy of resource use.

Both Canberra and New Zealand have been described as being less than successful in their ZW endeavours. In Canberra, the more recent *ACT Waste Management Strategy Towards a sustainable Canberra 2011–2025* (ACT, 2011) is a notably more reserved document than its predecessor: committing itself to trying to achieve ZW to landfill, rather than total production system transformation. Similarly New Zealand experienced difficulties in its goals to become ZW; Davies (2008) suggests that the project was blighted with questions of practicality. She identified that there was local variability in the application of the policy with weak central government control (Davies 2009) and she also questions the commitment from the private sector and suggests that the aspiration of ZW was primarily been left to community groups to promote (ibid).

These empirical studies suggest that ZW as interpreted by policy is not as ambitious as might be advertised. It has also been recognised that ZW ideas are not necessarily forwarded by centralised waste management policy (Davies 2008, 2009). This suggests it is necessary to look beyond stated policy goals to understand ZW.

ZW has only recently been adopted as policy objective, however, groups interested in the concept of ZW (although not necessarily using the term) have existed for a long time. In the early 1960s the social commentator Packard lamented the rise of disposal consumption, noting that the modern economy was set on “wastefulness becoming a major factor in keeping the wheels turning” (1960:185). In the following decades, the issue of wasteful consumption became closely associated with the environmental movement where recycling to “save the earth” was widely promoted in civil society (Strasser; 1999: 293). The term ZW appears to be first used as a political term in the early-1990s where community groups around the world, but predominantly in Australia and the United States, began to adopt the term for two connected purposes: to protest against unsustainable waste management (i.e. landfill and incineration) and to encourage more sustainable consumption (Connett, 2013).

There is little discussion of civil society ZW groups within the academic literature, however, Davies (2008) does briefly offer that both in New Zealand and Ireland, ZW Alliances act as a kind of connecting hub for anti-incineration, anti-landfill, community waste groups. These groups appear to offer cohesion to sustainable resource activists and their role is not limited to that of protest against existing forms of waste management. This would reflect the rhetoric of the ZW International Alliance (ZWIA), a global group who seek to promote and develop the concept of ZW. Established in 2002, ZWIA hosts international symposiums to facilitate knowledge and research on ZW and to help promote the principles of ZW (ZWIA, 2013a). They offer membership to groups from various sectors and many cities, regions and countries host their own ZW Alliance groups. It would appear that, on paper, these groups largely follow the definition of ZW outlined by the ZWIA (see Box 2.1 p40).

Box 2.1 Definition of Zero Waste from Zero Waste Alliance

‘Zero Waste is a goal that is ethical, economical, efficient and visionary, to guide people in changing their lifestyles and practices to emulate sustainable natural cycles, where all discarded materials are designed to become resources for others to use. Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them. Implementing Zero Waste will eliminate all discharges to land, water or air that are a threat to planetary, human, animal or plant health’ (ZWIA, 2013b)

Davies (2008: 167) notes that “civil society” tends to speak louder to the waste prevention and minimisation aspects of ZW. Connett (2013), one of the most prolific civil advocates of the philosophy, believes that ZW goals encompass waste management techniques of “source segregation” and “collection” but also included wider engagement with industrial design and consumption practices. Unlike ZW in policy circles, his ideas of what ZW entails have remained constant for over a decade (Connett and Sheehan, 2001; Connett, 2013). He is adamant that a ZW vision does not include incineration.

Incineration is just one indication where the philosophy of ZW conflicts with the idea in practical policy, yet there is little discussion of this tension within the ZW academic literature. Although ZW is often claimed to be anti-incineration, it is not clear if this

extends to avoidance of energy from waste (EFW). Davies (2005) has used incineration as an example of how waste management is “infused with conflicts” (p376). She argues that these politics are complicated and operate on a number of different scales: a finding that has been supported elsewhere (Gregson and Crang, 2010).

Davies suggests that ZW offers an alternative perspective in waste politics (2005) and yet, with the exception of her own brief discussions of ZW as a sub-component of waste strategy in New Zealand (Davies, 2008, 2009), no academic articles could be found which considered the interaction between civil society and ZW policy. For example, despite the presence of the ZW Alliance in the UK since 2007 (ZW Alliance–UK, 2012), Phillips et al. (2011) make scant reference to the organisation in their review of the government programme of ZW places in England. Similarly whilst there is a number of ZW Alliance groups in California (Ferry, 2011) Murphy and Pinceti (2013) also make no note of third party ZW groups in their analysis of ZW in Los Angeles.

The avoidance of the political and multi-scalar nature of ZW is considered a gap in the existing academic literature. As the next part of this section will show, within an academic context, there has been very little critical discussion of a ZW philosophy, despite the concept of ZW being considered across a range of disciplines and empirical studies.

2.3.2 Zero Waste in Academia

ZW has been linked to a variety of ideas including natural capitalism, industrial ecology, zero emissions and cleaner production (Curran and Williams, 2012), all of which have developed their own bodies of literature. Whilst these fields are undoubtedly linked to a broad understanding of ZW, consideration of each of these discussions (many of which focus on the engineering of particular products or industrial sites) is outwith the scope of this thesis. Zaman (2015) has found that ZW is often linked to a particular material or process. This literature review did not consider these papers as they use ZW predominantly as an industrial characteristic and are less focused on ZW as a societal goal. For the purposes of this review, emphasis was placed on studies which explicitly focused on the term *Zero Waste*.

A literature search produced a range of studies conducted on ZW in a variety of different journals. Articles were drawn from three main sources: *Waste Management and Research*, *Resources, Conservation and Recycling*, and *The Journal of Cleaner Production*. Each of these interdisciplinary journals claim to be interested in the technical and policy processes of waste management, with the latter two publications particularly interested in progressing towards more sustainable waste management. Note was also taken of references to *Zero Waste* where it appeared in waste governance literature.

The term was most often found as a side note to mainstream waste governance. The literature fell within three broad categories which largely formed around the achievability of ZW as a goal. One category was made up by those who openly promoted the technical goal of ZW; a more nuanced, but larger, group were less concerned with absolute ZW and considered the term a paradigm shift; and the final, smallest, category consisted of those who were critical of the concept. These standpoints primarily shaped the definitions used in the corresponding studies.

The largest group of papers adopted a view in which ZW was seen as a counterpoint to existing beliefs about waste. For some the concept went as far as to challenge the idea of what society thinks of as waste. Lehmann (2001: 157) suggests that ZW questions the belief that “waste is unavoidable” and Davoudi and Evans (2005: 510) thought that ZW promotes a “radical change” for waste in a UK context. Meanwhile other authors suggested that the goal promoted new approaches of governance. Clay et al. (2007:786) argued that the idea gives “new challenges and opportunities for government agencies charged with facilitating progress towards sustainability” and Davies (2005:385) suggested that it offered “alternative mechanisms for waste management”. On the other hand, whilst these authors were clear to promote the inspirational aspects of ZW, none really gave a definitive explanation of what the term means.

Those who chose to define the term tended to promote a holistic approach in which the idea of ZW as a systemic concept was promoted. Curran and Williams (2012:3) describe ZW as “a whole systems approach”. Zaman, (2014b:407) states that “ZW management is a holistic waste management concept which recognises waste both as a resource and a symbol of the inefficiency of our modern society”. Echoing this holistic

aspect is the promotion of ZW as both an indicator and goal of a closed-loop system of production.

This association with closed-loop systems means that ZW is often cited as a design principle (Speigelman, 2006; Zaman and Lehman, 2011; Curran and Williams, 2012). The consequence of this closed-loop design principle is that it requires a shift in manufacturing techniques from a linear process of production to a more circular system. At the time of the literature review, there was little discussion of the circular economy within academic literature beyond how the concept might be applied in China (i.e. Geng and Sarkis, 2012)¹. However, Greyson (2007) suggests that unless these design principles are developed in relation to new forms of consumption, the pursuit of economic growth may render the environmental benefits of such a paradigm shift less apparent.

Greyson (ibid) is not the only person to link the concept of ZW to environmental concerns: in 1997, Pauli (1997:110) made the claim that “the ultimate goal of cleaner production has to be zero waste, or the total use of all biomass and minerals on earth”. Davies (2008:14) also notes that the ZW movement is closely entwined with the values of “resource stewardship”. Yet, surprisingly the literature reviewed in this chapter offered very little discussion of the explicit environmental benefits of the idea beyond reducing waste in general. This echoes the findings of Murphy and Pinceti (2013) in their study of Los Angeles where they suggest the environmentalist principles of ZW have been lost in practice.

Despite these discrepancies amongst the literature, there remains a widespread understanding amongst the authors that the goal is “both pragmatic and visionary” (Curran and Williams, 2012:3). Equally, many have suggested that ZW is a philosophy which encourages new ways of thinking about waste (Young et al. 2010, Zaman, 2015). Speigelman’s (2006) conceptualisation of ZW as a norm challenging idea is fundamental for many of those who advocate the concept of ZW in scholarship. Whilst

¹ For a discussion of scholarship on the circular economy published after the completion of the literature review please see p186 of this thesis.

showing support for the provocativeness of ZW allows most scholars to remain neutral as to the goal's achievability, there is a further, smaller group of papers, which appear to adopt an almost unconditional enthusiasm for the term.

It would be unfair to suggest that the papers which appear to support ZW as an absolute and achievable goal do not also make claims about the concept's aspirational and paradigm shifting qualities. For example, Zaman (2014b:262) recognises the goal as "challenging the traditional" but also suggests that such an approach could "eliminate the 'waste phase' from the traditional life cycle" (p683). He is just one of a number of authors who do not outwardly question the vision of a society with no waste.

The articles which use the concept of ZW without questioning its viability are few in number. Like those who support the ZW as a paradigm shift, some are interested in the technical application of ZW (Zaman, 2014a, 2014b) whilst others consider the application of ZW within a specific context (Matete and Trois, 2008; Young et al. 2010). The latter are predominantly found within the waste management journals which tend to focus primarily on technical applications.

It would be fair to say that rather than unconditionally supporting ZW these papers adopt what they implicitly suggest is the universal definition of ZW. Their approach is not necessarily to vehemently push a vision of a society with no waste but they do fail to show that there might be alternative interpretations of ZW which do not eliminate waste entirely. This is best seen in Young et al.'s (2010) paper on ZW in Taiwan. They describe ZW as "a philosophy that seeks to guide people in the reshaping of their resource-use pattern with the ultimate goal of reducing waste to zero". They analyse the municipal solid waste (MSW) and industrial waste recycling rates and suggest that they show that Taiwan is moving towards ZW. This presents quite a limited definition of ZW where the authors are using target indicators as synonyms for ZW.

Similarly Zaman (2014b) also adopts an indicator approach to evaluating ZW. He suggests that these indicators should include socio-cultural, economic, environmental and governance aspects which offer a more encompassing ZW definition than Young et al. (2010) but it still suggests that he recognises that ZW will be defined by societal indicators rather than the absolute elimination of all waste. Nevertheless he does not say

this explicitly and continues to describe ZW as removing the “waste-phase” of production and consumption systems (Zaman, 2014b:408)

There is very little literature which explicitly criticises the goal of ZW. This review uncovered only two potential contrasting opinions, one that opposed the philosophical idea of ZW and the other which sought to criticise the practicality of the goal. However, it could be suggested that the latter is somewhat of a straw man.

Greyson (2007:1383) states that “ZW is often misrepresented as unrealistic” however, this literature review found no examples of academic work which made such basic claims. Davies (2008:139) does suggest that the term evoked criticisms of this type when it was adopted by New Zealand policymakers, yet even then it seemed to be a case of semantics with opponents preferring the less ambitious “waste minimisation”. The one criticism that could perhaps be made of some academic papers is that they do not issue caveats for their ambitions for ZW; for example Zaham and Lehmann (2011:177) suggest that “ZW cities would recycle 100% of their waste or recover all possible resources from waste streams and produce no harmful waste for our environment”. Whilst this criticism might be levied at individual papers it is not really appropriate to levy at the whole ZW community.

In contrast Scanlan (2005) gives the most convincing critique of the goal of ZW. He is not only concerned with waste as a material concern but with the general idea of garbage as anything discarded by society. He considers how waste has come to mean “improper use” (p22) and that this concept can be extended to resources, knowledge, places and people. He suggests that garbage is seen as the “result of human error” and thus “something that can be eradicated” (p57). This, he argues is a false promise; for Scanlan “garbage never really disappears but instead takes on different forms” (p166); he argues that this poses fundamental questions about the goals of modernity to live free and individual lives. His critique of environmentalist ZW arguments (although notably he does not use the term ZW directly) is that they seek to solve waste problems with the same reasoned enlightenment that results in landfill in the first place. This argument is simply that ZW perpetuates the impossible Western aspiration of clean and efficient living.

Gregson and Crang (2010) offer further support of this argument by suggesting that the European Waste Hierarchy (EWH) (which has been considered closely linked to the goals of ZW (Townend, 2010)) “may have transformed waste to resource but it has done so by performing a vanishing trick upon the physical remainder of waste” (Gregson and Crang, 2010:1028). Hetherington (2004:163) also argues that disposal is an “epistemology” in that we choose how and what to ignore to fit within our boundaries of order.

Whilst, undoubtedly, this is the most reasoned critique of ZW that has been identified within this literature review, it is also open to discussion. Hultman and Corvellec (2012:2414) acknowledge that the EWH is “normative” as “it ranks the desirability of practices” and they recognise that this has profound effects on how we view waste in society. They argue, in contrast to Gregson and Crang (2010), that the EWH has opened up waste management where discussions of “culture and social relations become explicitly relevant” (Hultman and Corvellec, 2012:2421) and as a consequence the EWH “makes design, production and consumption subjects for policy making” (p2418). Taking their argument, ZW does limit the scope of policy-making for waste but it expands it far beyond current practices; it both “affirms and dissolves an infrastructural separation” between society and nature (p2419). In this sense Hultman and Corvellec clearly support the aspirational nature of the goal but acknowledge the limits of the idea by embracing the material restrictions of waste. Gregson and Crang (2010) suggest that much waste research is “staunchly immaterial” (p1026), a criticism that could be levelled at Scanlan (2005).

It could be suggested that there is little escape from the physical presence of waste and, from a sustainability perspective, it is arguably better to ensure that this materiality is managed in the most holistic manner; an idea promoted by most conceptualisations of ZW. Scanlan’s (2005) evaluation of the environmental movement is quick and not fully developed and to be generous, it could be suggested that his critique could be directed towards an apparent lack of reflection from those advocating ZW. Thomson (1979) argued that this type of reflection is required for any waste research: as a consequence, it is deemed important to outline how ZW is defined within this thesis.

2.3.3 Zero Waste in this Thesis

In his 1979 ‘Rubbish Theory’ Thomson offers a methodological insight into ‘rubbish’ research. The crux of his thesis is that rubbish comes to mean that which has “no value” (p9) and that studying the transfer of an object from valued to valueless can shed insight on social relations. However, for Thomson, rubbish is closely linked to social mobility and so “the boundary between rubbish and non-rubbish is not fixed but moves in response to social pressures” (p12). This transience, he contends, makes rubbish a process rather than a concept which raises difficulties for research as concepts are considered more static than processes and so easier to research. The same could be argued of waste. His suggestion is that researchers remain aware of their own relationship between their world views and the concept which they research.

This thesis has not set out with a specific understanding of the term ZW but instead acknowledges that ZW reflects a spectrum of understanding about sustainable resource management. These definitions range from the most basic ZW to landfill to the systemic change of our production process to a closed-loop system which will require a re-evaluation of our consumption practices. It does, however, take the view that each of these perspectives represents a global shift in the classification of waste as rubbish to waste as resource. It also supports those who argue that this links ZW with aspirations for more sustainable development (Greyson, 2007). The goal of this thesis is not to question whether any one particular definition of ZW is achievable. Instead it seeks to understand how this goal has manifested and might be achieved within a policy context. This multi-perspective construction of a sustainable society sits well with a Sustainability Science approach.

This thesis is interested in understanding not only what ZW means as a policy goal, but also how these objectives interact with governance techniques and practices. The current research of ZW governance is piecemeal and theorisation is limited. Consequently the literature review was expanded to include studies in sustainable waste management. These studies often do not discuss ZW explicitly but do consider the environment and resource protection as an important feature of waste management. It was found that there are four key themes emerging from waste governance literature

that are pertinent to this thesis: modes of waste governance; stakeholders in waste management; governance scales; and techniques of governance.

2.4 Zero Waste and Waste Governance

It has been noted that waste governance research is “embryonic” (Davies, 2008:3), however, there is a growing body of literature which discusses waste from a governance perspective (Gille, 2010). It has been suggested that this literature often considers waste within “rehearsed concepts” of governance (ibid: 1050). This review found that many studies were more interested in using waste as an illuminating case study to provide insight into governance ideas, rather than using governance as a way of understanding waste policies.

As a consequence this section does not attempt to classify waste governance research within existing types of governance study nor does it attempt to cover the relationship between waste and all considerations of governance concepts. Instead it has chosen four key areas linked to governance and sustainable waste management policies: modes of governance, actors in sustainable waste governance, governance techniques and governance scales.

2.4.1 Modes of Governance

For Bulkeley et al. (2007) modes of governance constitute a particular series of debates within governance literature. They note that it has a number of meanings in the literature ranging from “different institutional arrangements” to particular types of policy techniques, but they suggest that there is no clear definition of the term (p2736). For Bulkeley et al. a mode of governing is “a set of governmental technologies deployed through particular institutional relations through which agents seek to act on the world/other people in order to attain distinctive objectives in line with particular kinds of governmental rationality” (p2739). Their understanding of modes of governance and its link to governmentality will be discussed further in Section 2.4.5 (p57) of this chapter.

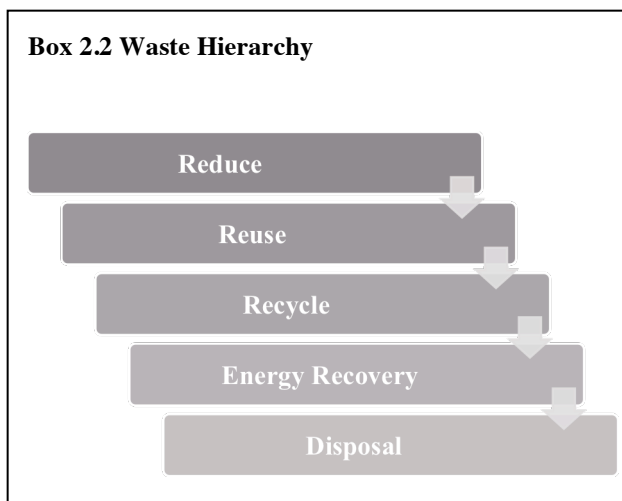
For current purposes it is sufficient to consider a mode of governance as a kind of common waste management objective. Various sources have cited the importance of

common objectives for sustainable waste management (Costa et al. 2010; Lehmann, 2001; Young et al. 2010:). Bulkeley et al. (2007) find four modes of governance present in waste practice in the UK: disposal, diversion, eco-efficiency, and waste as a resource. This categorisation provides a simple framing through which to understand developments in different approaches to waste management.

Watson et al. (2008:486) suggest that there has been a broad move towards more sustainable waste policy from a “disposal paradigm” to “waste as a resource paradigm”. This shift has been associated with the aspirational idea of ZW. It is also largely reflective of the widely used waste hierarchy (see Box 2.2 p49).

The waste hierarchy is a normative heuristic which has been adopted at regional, national and local levels. Hultman and Corvellec (2012) say that the EHW ranks management techniques in sustainable waste governance. They argue that it signals a move in which environment and the economy are considered simultaneously, and ask whether it contributes to sustainable consumption ideas by making the “interconnectedness between humans and materiality visible” (p2421). Whilst they admit this remains to be seen, they do suggest that the EWH is making the “generic concept of waste” less important by focusing on resources (p2422).

Other literature has not placed such high a value on the role of the waste hierarchy, however, the concept is widely referred to and seen as a central feature of European Union waste legislation (Bell and McGillivray, 2008) and waste governance techniques are often considered on how they relate to the waste hierarchy. The waste hierarchy



could be considered an objective unto itself or it could be a normative representation of the modes of governance identified by Bulkeley et al. (2007).

It has been suggested in waste governance literature that waste policy can seek to achieve a number

of objectives and Bulkeley et al. (2007) found that links to previous policies meant that more than one mode of governance was apparent in waste management in the UK at any one time.

The legacy of previous waste management approaches on ZW policies has also been noted. In their study on Los Angeles, Murphy and Pincetti (2013) found that waste continued to be dealt with at the local level and whilst attitudes had changed, regulations remained out-dated. There is no literature which explores the interaction between previous waste policies and ZW goals, and yet research suggests previous policies can have impact upon current waste management practices.

2.4.2 Actors in Sustainable Waste Management

Waste management has traditionally been a central government concern, this is a legacy of what Girling (2005:26) terms “a politics of disgust”: where waste was considered something to be dealt with out of sight. Various studies have found that the general public have limited knowledge of waste management (i.e. Bull et al. 2010; Henriksson et al. 2010; Hird et al. 2014) and industry (Posch, 2010) and yet it has been claimed that sustainable waste management necessitates the combined involvement of industry, government, academia and the general public (Lehmann, 2011). This mutual cooperation on waste management strategy reflects the ubiquity of waste in society; it affects every business, every household and every local community. Moreover, for a waste policy to be successful, many studies have found that the relationship between these stakeholders is as important as their presence.

In her comparative study of garbage governance, Davies (2008) refers to these relationships as interactions, and her findings on these interactions reinforce the importance of context in waste management studies. She found that whilst both New Zealand and Ireland have active civil society groups, in New Zealand, these non-governmental organisations were better networked and so had a larger influence on policy. Networks are a key concept in much of waste governance literature.

Watson et al. (2008:485) suggest that networks “enhance” the policy process by encouraging policy integration. They found that the lack of links between waste

management policy-making and land-use planning meant that waste strategy did not reach its full potential. Partnerships are not only encouraged at a policy level but also are viewed as necessary for industrial networks where it has been suggested that “sustainability networks” with more focus on “stakeholder cooperation” are essential for the kind of industrial symbiosis required for a closed-loop economy (Posch, 2010: 245). These networks are also important within businesses, with links encouraged between waste management and design (Deutz et al. 2010).

As a consequence, different stakeholder knowledge is also thought to be a key component of implementing sustainable waste strategy. Bulkeley and Gregson (2009:942) argue that waste policies currently focus on “low-hanging fruit” because they do not require engagement with understanding the practice of discard. They suggest that this refocus should not only be on individuals but should also look at society as a whole to recognise that waste “is social and situated as much as individualised” (p937). Davoudi and Evans (2005) also argue that waste policy requires the input of a “range of knowledge” both to encourage a shared understanding to meet targets but also because there is a lack of clear data and information in waste management (p500).

Davoudi (2006) goes on to contend that focus within waste management has, thus far, tended to be on technical knowledge but argues that further reference must be made to social dimensions of waste. This, she has suggested, is because the technical approach has been considered “expertise” in the waste management industry and she calls for a more collaborative approach to waste strategy in which all knowledge is valued (p697). Petts (2004,2005) also highlights the role of technical experts in waste policies, which she argues excludes many from engaging in debates. Davoudi (2006) suggests that this causes a barrier between technical and social participants and calls for a kind of boundary organisation or actor who can bridge links between different stakeholders.

Davoudi and Evans (2005:497) suggest this role could be (and in part already is) played by Regional Technical Advisory Boards: “local mediators” who “facilitate collaboration”. Elsewhere, others have suggested this role could be played by academics and universities (Bulkeley and Gregson, 2009) who, until recently, have largely avoided engaging with waste. In his research *Creating Wealth from Waste* Murray (1999:147) is

very explicit that what is needed is a ZW Agency which can not only administer financial encouragements for ZW but can also house “a waste academy” and an advisory service. Tudor et al. (2011) point to the UK development of WRAP as such a body which “identifies opportunities and coordinates information relating to waste and offering advice and technical support” (p59). These bodies not only become actors in waste regimes but also emerge as a technique of governance to enhance a sustainable waste strategy.

2.4.3 Techniques of Governance

There is a variety of techniques designed to promote sustainable waste management ideas and it can be difficult to identify any coherency within the approaches advocated, not only from empirical studies but also within the academic literature itself. In her comparative study of national sustainable consumption programmes, Berg (2011) finds that there are elements of coherence both within and across initiatives but there is often little identifiable strategy in approach. This she argues is because these programmes are ‘not roadmaps but toolboxes’ and techniques of sustainable waste management appear to manifest in a similar way.

Davies (2008) calls these tools of waste management, ‘interventions’ and she identifies five categorisations of interventions used in New Zealand and Ireland: policy documents, policy initiatives, legislation, policy instruments and funding schemes (p30-31). She also notes that these interventions differ from country to country and recognises that the cultural, political and economic specificities of a country can shape waste policy (p161). Both findings make it difficult to support an overview of sustainable waste management, as this would suggest that techniques change depending on context.

This does not mean that some studies have not tried to suggest specific techniques or to highlight comparisons of a variety of instruments which might encourage more sustainable waste management. Several studies have given comparisons of a number of waste policy instruments (Finnveden et al. 2013; Zaman and Lehmann, 2011); or advocated for a particular technique (Greyson, 2007; Zaman, 2014a). A further selection of papers that evaluated ZW policies chose to focus on the limitations of

particular actors within regimes rather than suggesting more universal observations (Murphy and Pinceti, 2013; Philips et al. 2011). Again the links between the goals of ZW and chosen techniques of governance has not been explored in any study.

This thesis is interested in understanding the relationship between governance techniques and governance goals for ZW. As a consequence, it is not considered necessary to provide an overview of all techniques which have been suggested as potentially useful in promoting sustainable waste management, instead attention has been paid to those studies which highlight relationships between waste management technique choices and policy goals. These are discussed under Davies' five categories, however, it should be reiterated that - whilst some generalisations occur within the literature review - the use of these categories is still primarily particular to the given context of the study.

Policy Documents

For Davies (2008) this category involves strategies, which she suggests, appear to come directly from the central government; however, they have been used elsewhere by regional or city level administrations (i.e. Zaman, 2015; Murphy and Pinceti, 2013). Davies (2008) noted that in Ireland the waste strategy was promoted from a European Union perspective whilst in New Zealand, local politics played a bigger role. This again highlights the importance of considering context.

Beyond the strategies themselves, it has also been noted that communication of the strategy goals is also important. Nilsson et al. (2009) found that regardless of strategy, previous waste management stances played a role in interpretation of the policy. Equally important is the understanding of stakeholder responsibilities required to achieve the strategy. Nilsson et al. have noted that waste strategies can be interpreted differently by actors at different scales which can undermine the original objective. This suggests that strategy alone is insufficient to indicate a new policy goal; this thesis is interested in understanding how the Scottish ZW Strategy (the ZW Plan) links to interpretations of the policy goal.

Policy Initiatives

Davies (2008) indicates that policy initiatives include awareness programmes such as waste prevention and minimisation. Her examples suggest that these initiatives can be national, however, other literature argues that these can also occur at regional and local level. Speigelman (2006: 9-10) contends that local governments can act as both “waste management educators” and “waste reduction advocates” to promote ZW and Zaham (2014a and b) investigates how a ‘ZW Index’ can enhance performance of cities by highlighting key areas for development in waste strategies.

It is recognised that educational campaigns and policy initiatives, particularly in respect of waste reduction and minimisation, are often promoted by NGOs and community groups, rather than central government institutions. Mazzanti and Zoboli (2008) reported that there was no noticeable link between policies and waste minimisation across the EU, meanwhile others have found that waste reduction and minimisation policies have been actively and consistently promoted by non-governmental organisations (Davies, 2008). Equally it has been noted that these groups can influence policy initiatives within central government (as Davies (2008) suggests occurs in New Zealand). The understanding of what initiatives emerge from policy and how existing initiatives influence policy in ZW, is a point of interest for this thesis.

Legislation

Regulations are another key policy intervention promoted by various sources as a governance tool for more sustainable waste policies. It has been recognised that waste regulations can take various forms which extend beyond traditional command and control regimes, for example the use of landfill taxes; waste management licences and permits. (Wolf and Stanley, 2011) In addition, Entwistle (1997) suggests that waste regulation has developed beyond compliance methods and has adopted a more cooperative approach. Research by Nilsson et al. (2009:15) suggests that traditional regulatory mechanisms are more effective than newer forms of governance and argue that “only regulatory and market-based instruments steer real behaviour”.

There is no literature discussion that identifies specific legislation for ZW: however, there are considerations of number of product-related regulations which promote some of the closed-loop thinking associated with ZW. These regulations extend to packaging,

waste electronics, waste vehicles and a number of other particularly hazardous waste streams and have been linked to the 2003 EU ‘Integrated Product Policy’ which encouraged life-cycle thinking. Malcolm (2011) suggests that it is easier to regulate for specific products which allow the continuation of existing economic growth goals than it is to question the ecological affect of our consumption practices.

Support for this argument can be found elsewhere where it has been shown that waste reduction and minimisation efforts are largely voluntary and left to non-governmental actors (Bulkeley and Gregson, 2009). This might suggest that these are less important aspects of a ZW policy. This thesis seeks to identify whether legislation has an impact on how ZW is understood in Scotland and how regulation is being used to encourage the goal of ZW.

Policy Instruments

Like regulation, policy instruments are numerous in their variety. Davies’ (2008) categorisation links policy instruments to taxes, directives and legally binding schemes (like the producer responsibility schemes associated with waste electronics). Again it has been noted that policy instruments mostly focus on the lower end of the hierarchy (Finnveden et al. 2013). It is also recognised that “policies and policy instruments in other sectors will also influence waste management” (ibid: p844). This suggests that the policy instruments which are at play in a ZW regime could be both numerous and not directly connected to ZW goals.

There are no studies which have sought to identify the policy instruments within a ZW regime. Some studies have attempted to evaluate waste management policy instruments in relation to SD (Finnveden et al. 2013) and others have chosen to consider policy instruments that might be promote ZW (Zaman, 2014a, 2014b). This thesis seeks clarification on the importance placed on certain policy instruments within a specific context and to identify how these policy instruments interact with understandings of ZW policy in that context.

Funding Schemes

Finally Davies (2008) sees the self-explanatory funding schemes as a type of policy intervention. Whilst Davies identifies funding schemes at operation in both Ireland and

New Zealand, and Bulkeley and Askins (2009) claim new funding is available within the UK, there is little discussion of this elsewhere in the literature. Lehmann (2011) suggests that a lack of willingness to pay for infrastructure is a barrier to ZW (p165) and Phillips et al. (2006) have also identified a lack of long term funding as hindering the development of industrial symbiosis. This thesis seeks to identify the type of funding that is used to promote the policy goal of ZW and how that funding relates to understandings of ZW.

2.4.4 Governance Scales

Scale has been highlighted in a number of studies as an important consideration for waste management (i.e. Davies, 2005; Watson et al. 2008; Nilsson et al. 2009). Watson et al. (2008:495) have suggested that waste policies can be “distorted” in application at the local level, a view supported by Nilsson et al. (2009). They both suggest there are issues of coordination across local and national levels. Elsewhere it has been suggested that policies must also be considered in relation to household practices (Bulkeley and Askins, 2009; Tudor et al. 2011).

Davies (2005) suggests that scale is important, not just in coherency of existing policies but also from the perspective of influencing new approaches. In her study of incineration in Ireland she found that the issue operated on a number of scales regardless of actors; in particular she found that activists “adopted complex scalar strategies” to promote their cause (p392). On the other hand, despite this dynamism, the inherent physical materiality of waste which necessitated certain economies of scale meant that national governments often continued to yield most power.

Gregson and Crang (2010:9) contend that attention to waste policy at different scales can counteract some of the issues of “invisibility of waste” when viewed from certain perspectives. Gille (2010) also argues that scale is important to increase understanding of waste scholarship. She argues that waste research is too ready to focus on the micro level and that we need to use a more macro level analysis to understand the nature of power within waste. Certainly within waste governance literature there has been a focus on municipal waste as an area of study. Tudor et al. (2011) suggest that this is

because municipal waste is given prominence in public governance; they argue that this makes it a key area of study. However, taking Gregson and Crang's (2010) point of view it could be suggested that waste governance has limited itself by focusing solely on municipal waste; a perspective that perhaps does not reflect the recent developments in much of waste policy. Gille (2010) takes a more cynical view in suggesting that it is easiest to gain access on this level for fieldwork.

Gille (2010) suggests that there is confusion in waste literature when considering scale as an aspect of analysis. She notes that materiality has meant that analysis is often conducted at the local or micro level, this she argues is a confusion within waste governance literature of the concepts of scale with the idea of abstraction. She argues that a focus on the macro-level management of waste does not necessarily mean that studies would become more abstract. As a consequence, she calls for more macro-level research which can give "a more nuanced understanding of how local and national waste actors and practices deflect or use global ones" (p1062). This she suggests will contribute to theoretical understandings of waste governance, a currently underdeveloped area. She suggests that a more active theorisation of waste governance could provide more detailed insight into waste management on a macro level.

2.4.5 Theorisation of ZW Governance

The use of social theories to understand ZW governance is limited. It has been suggested that there is a lack of theoretical analysis of waste governance in general (Gille, 2010; Scanlan, 2005). It might be suggested that in most cases where social theory plays a role in shaping the waste governance research, its aim is to use waste as a "parallax object" to question existing understandings of social theory concepts (Moore 2012:2). Taking examples from this literature review, waste has been used to understand justice issues (Watson and Bulkeley, 2005; Richardson et al. 2010); civic engagement (Bull et al. 2010); risk (Petts, 2004) and policy integration (Watson et al. 2008).

A few researchers have attempted to link social theory and waste in an effort to better understand waste governance. Davoudi and Evans (2005) develop the concept of capital to understand the role of Regional Technical Advisory Bodies in England. They suggest

that these organisations rely on four types of capital: intellectual, social, material and political. Their analysis focuses heavily on the role of these specific organisations and whilst they acknowledge both that political capital requires “the ability to govern in a climate in which power is increasingly diffused” and that success depends on whether “ideas have leverage in other waste policy arenas” (p513) they do not explore how this power manifests with other actors or in other situations.

This links to Gille’s (2010) criticism of waste scholarship’s failure to engage with macro level politics. She uses Actor Network Theory (ANT) to understand power dynamics of waste governance in Hungary. She finds ANT, when used on a macro level, too readily associates waste with a generic idea of value and leaves “no theoretical room to discern whether [the] macro-level dynamics are quality different from those at the micro-level” (p1060). She suggests that the use of the concept of waste regimes: “social institutions determine what wastes, and not just what resources, are considered valuable by society, and their institutions regulate the production and distribution of waste in empirically tangible ways” (p1056). She argues waste regimes are a “broader and deeper” concept than macro power (p1056) – allows greater insight into waste, particularly by allowing consideration of the material and cultural aspects of waste governance.

In a similar way that Gille uses regimes to complement ANT, Hird et al. (2014) use governmentality to complement Latour’s political theory of the relationship between material objects and political issues. They suggest that waste management is an example of neo-liberal governmentality, a rationale of governance which is shaped by techniques and practices which focuses on individual responsibility. Building on Latour’s theory they argue that waste has continuous materiality, and this familiarity does not encourage public engagement in the issue. They use governmentality as an example which, as will be explained in Chapter 3, is a particular use of the concept that is critiqued in this thesis.

Governmentality has been used by a number of studies in waste research. Like Hird et al. (2014) most have used it as a descriptor of a type of governance approach (Bull et al. 2010, Bulkeley et al 2007). However, it has also been used as a theory of how governance works and some studies have employed it as a way to make sense of the

complexity of waste governance practices (Bulkeley et al. 2007). The theory has proven popular perhaps because – like Gille’s (2010) regimes – it seeks to “theorise rather than simplify the complexity of waste governance” (Bulkeley et al. 2007:1062). Equally it allows the appreciation of empirical context which it has repeatedly been suggested are an important aspect of waste scholarship (Deutz and Frostick, 2009).

Bulkeley et al. (2007:2734) use governmentality as a way to highlight modes of governance operating in waste regimes. They argue that governmentality is an ideal framework through to which to understand waste regimes as it recognises both the importance of “structures and processes” and the “plurality” of these institutions. They suggest that modes of governance can be identified by “rationalities, agencies, institutional relations, and technologies of governing that coalesce around particular objectives and entities to be governed” (p2734). They link these modes with existing understandings of governmentalities. Davies (2008) has also used governmentality in her comparative study of Ireland and New Zealand. She suggests that a comparative study allows insight into “the ways in which waste is governed and the reasons why it is governed that way” (p175). As previously discussed in this chapter (p50 and p52) This thesis draws on Davies’ and Bulkeley et al.’s (2007) approach but uses a more established framework for analysis (Dean, 1999) which has been used to understand a number of environmental governance issues (see p91 for further discussion).

To date all governmentality studies in waste have only considered municipal waste. This is a major limitation. Municipal waste presents as only a small percentage of all waste generated and in order to understand ZW as a policy goal, consideration must be given to waste governance at a systemic level. Despite these limitations, the existing work on governmentality forms a small but solid base through which it becomes apparent that governmentality is a useful theory to develop an understanding of ZW governance.

2.5 Research Aims and Contributions

The lack of sociological and political consideration of ZW was highlighted as important in the section of this chapter which gave an overview of ZW definitions in policy, activism and academic scholarship. It was suggested that the academic scholarship was

limited in its constructions of ZW and in its failure to consider the idea as a political concept which emerges through both policy and civil society. This thesis attempts to develop the understanding of ZW in academia by considering the interplay between ZW policy and ZW governance in practice: achieving the first aim of this thesis to develop an understanding of ZW policy in Scotland

The chapter began with the observation that ZW literature does not engage with sociological waste literature. It was suggested that acknowledgement of particular discussions within this literature could develop ZW scholarship. In particular it was claimed that the consideration of disposal, context and policy history of waste should be taken into account.

The final section of the chapter reviewed scholarship on waste governance to highlight relevant discussions to ZW. It was found that there are four key themes which emerge from this literature which were deemed significant for this thesis; modes of governance; actors in sustainable waste management; techniques of governance; and governance scale. It was suggested that whilst theoretical understanding of waste governance is in its infancy, governmentality has been found to be a useful framework through which to make sense of the complexity of waste regimes.

This thesis contributes to the literature reviewed within this chapter by presenting ZW as a political concept requiring socio-political analysis from a governance perspective. It is hoped this will not only open up understandings of ZW to link it with existing literature on waste governance but will also present an investigation of ZW accounts for the spectrum of definitions that accompany the term. The most significant contribution is in relation to the particular use of governmentality to understand ZW. The role played by governmentality is discussed in the next chapter where the concept as used in environmental studies is explained in more detail, and clarification is given on how the idea is used within this thesis.

3 Theoretical Framing: A Governmentality Approach

3.1 Introduction

‘So common and widespread is its usage that, were one to adopt the North American invention the ‘Hall of Fame’ extending it from sport and entertainment to the world of social science concepts, then a strong case could be made for the inclusion of governmentality’ (Walters, 2012:44)

This chapter explains the construction and use of theory in this thesis. The discussion from the previous chapter suggests that any study that seeks to gain further understanding of ZW governance should employ a theoretical lens that allows consideration of both governmental and societal practices. This thesis contends that Foucault’s concept of ‘governmentality’ offers an appropriate framing from which to make sense of waste governance and the project used the concept as an “analytical toolbox” to “open up new ways of understanding social and political problems” (Walters, 2012:4).

This thesis has shown that academic consideration of Zero Waste (ZW) governance is limited. Existing ZW governance research has chosen to focus on empirical studies of specific policies and, echoing criticisms made of other waste governance research (Gille, 2010), there has been no effort to theorise ZW policies in the literature. This could be attributed to the perceived complexity of ZW governance.

Governmentality is seen as offering “an analytical framework that is especially useful towards connecting abstract societal discourses with everyday material practices” (Ettinger, 2011: 538) which presents it as a suitable theory to make sense of waste. However, governmentality has also been identified as a “useful lens through which to examine political regulation and programmes of governance” (Agrawal, 2005:222) as well as a method to encourage alternative approaches to managing environmental issues (Rutherford, 2007). As such it would seem a promising theory through which to gain a better understanding of ZW for the purposes of this thesis.

Scholars claim that “pinning down just what Foucault means by governmentality is by no means straightforward” (Walters, 2012:10), that governmentality literature is “vast” (ibid:1) and operates in multiple “paradigms” (Dean, 1999:4). It is also said that governmentality is “often deployed in ways that belie its original formation” (Rutherford, 2007:292). As a consequence the first part of this chapter spends some time clarifying governmentality as it emerged originally in Foucault’s work and then as it has been subsequently applied in later literature. The purpose of this review is not because this thesis seeks to contribute directly to academic discussions of what governmentality is, or debates about the consistency of its application, but rather to provide a common vocabulary and starting point through which to take the focus of this thesis: governmentality as used to understand sustainability problems.

The second part – and bulk – of this chapter considers governmentality as it has been used to understand rationales behind governance of environment: or environmental governmentality. This thesis argues that governmentality of the environment has been conceptualised in both a ‘general’ and ‘specific’ way: a distinction developed by Golder and Fitzpatrick (2009). The section begins by identifying ‘Ecogovernmentalites’ as forms of specific governmentalities that have been identified from within environmental regimes. The section then considers the more general or analytical framings of governmentality of the environment, through the idea of ‘Environmentality’. The section concludes by reviewing the latest development in environmental governmentality: ‘Governmentality for Sustainable Development (SD)’. Through Governmentality for SD scholars have attempted to move beyond critical reflections of environmental governmentalities towards a more transformationalist use of governmentality. This thesis argues that this interpretation of governmentality is particularly compatible with a Sustainability Science approach.

The final section of the chapter outlines how governmentality has been used in this research project. Building on the claims of those who see empirical context as important in governmentality studies (i.e. McKee, 2009 and Keskitalo et al. 2012) a review of relevant studies of waste and Scotland is offered. Developing this idea, the methodological application of governmentality used in this research project is then presented. The chapter concludes by clarifying the research aims and envisaged contributions of this thesis.

3.2 Fundamentals of Governmentality

Foucault first developed his concept of governmentality in public lectures delivered in Paris in the 1970s. A late development in Foucault's work, governmentality was used to describe a number of ideas linked to 'the art of government' and is often described as being an uncompleted project. Nevertheless, the concept has been picked up in its various forms by numerous authors (as argued by Dean, 1999; Walters, 2012) and, as a consequence, some commentators have suggested that many governmentality applications have moved far beyond Foucault's original idea (i.e. Rutherford, 2007; Walters, 2012).

Numerous specific concepts have emerged in governmentality studies, and this section does not seek to address and clarify them all. In the second edition of his influential work on governmentality, Dean (2010) expresses his surprise at the way in which many of the concepts he created to shed light on a complex problem have been expanded on in others' work. Without criticising these approaches, Dean reminds users of governmentality theory to be mindful that our own "statements, analyses and concepts are a form of action in themselves" (p15). Taking this advice, this section will focus on explanations of governmentality that meet the needs for the reader to understand this thesis.

This thesis seeks to use governmentality as a concept to make sense of existing ZW governance practices in Scotland, in order to investigate how these approaches might be developed to achieve more sustainable resource use. In this sense it does not aim to directly contribute to Foucault's conceptualisations, nor to review or critique the various ways in which post-Foucauldian governmentality has emerged. Nevertheless, in order to explain how the theory is used in this thesis, it is necessary to present how the theory has been used to understand environmental governance in the past. In order to explain previous applications of governmentality, an understanding of the terms used within the theory is also required. Walters (2012:46) notes that "studies of governmentality [have] evolved [their] own terminological repertoire that is distinct". This section of this chapter offers insights into that repertoire to improve the accessibility of discussion in later sections.

In Foucault's original lectures on governmentality he presented the concept as covering three aspects: (i) the cooperation through which governmentality as a "complex form of power" manifests; (ii) the development of the concept of governmentality as the predominant form of power in modern Western Society; (iii) and the process by which the sovereign "State of Justice" in the Middle Ages transformed into a more "governmentalised" administrative state (Foucault, 1994:219-220). More accessibly, Walker (2012:10-11) interprets governmentality as:

- i. governmentality in a broad analytical sense: i.e. "as a project that examines the exercise of power in terms of the 'conduct of conducts'";
- ii. governmentality as a "particular domain of governance" i.e. "the governance of and by states"; and
- iii. governmentality as a category of techniques for governance i.e. liberal governance

Golder and Fitzpatrick (2009:31) suggest that the concept has "both a general and specific meaning". The general meaning of governmentality, they state, "refers to any manner in which people think about and put into practice, calculated plans for governing themselves and others" (ibid). In contrast, they suggest that Foucault's "specific" studying of governmentality was "a particular mode of deploying and reflecting upon power" in the history of the modern state (ibid). In documenting the concepts used by governmentality clarity is achieved by considering them under these general and specific governmentality headings.

3.2.1 General Governmentality

The recognition that the majority of Foucault's work was centred on "the relationship between ideas and practices" (Hunt and Wickham, 1994:10) and that governmentality is the extension of this interest to governance domains, is a useful gambit to explain governmentality in its general conceptualisation. Secondly, but no less important, is the appreciation that Foucault was interested in the way power created, connected and reinforced these ideas and practices.

Foucault's particular notion of power is central to grasping his concept of governmentality. Hunt and Wickham (1994:14) argue that he posed "a radically new account of power" which parted from the traditional political theory and suggested that, in modern government, power does not originate from a single locus. Instead Foucault believed that power manifests in – what Hunt and Wickham (1994:16) have termed – "small powers". These "small powers" are found in a complex system of institutions, regulations, and norms; a system that Oels (2005: 186) describes as "decentralised webs". Governance strategies are an accumulation of the "small powers" working together, rather than the goal of a specific government or sovereign decision.

This description of power links to many ideas contained within the concept of governance and researchers have noted the similarities between governance and governmentality. The terms may emerge from a similar conception of power, however, they should not be seen as synonymous. Walters (2012:64-65) notes similarities between governance studies and governmentality in that both are interested in how governing is practiced, rather than focusing on institutions, or traditional state actors. However, he argues that governmentality takes a more descriptive and less developmental approach to understanding governing beyond the state.

McKee (2008:185) explains the difference by suggesting that governmentality "transcends moral judgements about the proper form of 'good' and 'democratic' governance" and so often avoids the normative aspects contained within governance studies. Gouldson and Bebbington (2007:12) suggest that focus of interest is the discerning factor between concepts, with governance interested in the "assemblage of actions and mechanisms that are in place to govern certain actions" whilst governmentality goes a step further to clarify these as "modes of governance". Each of these differentiations point to the idea of governmentality as a particular approach to understanding governance. This claim makes even more sense, if we return to Foucault's primary focus of research on 'ideas and practices' for these are the building blocks of Foucault's concept of knowledge, a term that he links closely with governance.

According to Foucault, knowledge cannot be reduced to a single concept but rather is constituted "in relation to a field of statements" (what Foucault termed 'connaissance')

and through “objectives, instruments, practices, research programmes, skills, social networks and institutions” (what Foucault termed ‘savoir’) (Rouse, 2005:113). In other words, under Foucault’s definition, knowledge is the collection of common understandings in a particular domain. Foucault’s interest in power, comes from seeking to ascertain how these common understandings come about. The analytical process of identifying the relationship between power and knowledge in a governing domain is what can be recognised as governmentality.

Foucault did conceptualise governmentality as a way to make sense of rationales of governance, but the expansion of governmentality as an analytical method predominantly occurred after his death. Walters (2012:45) states that numerous studies have contributed to governmentality as an “intellectual software, capable of movement across academic borders and deployment in various settings” but he argues that by far the most influential work is Mitchell Dean’s ‘Analytics of Government’, the work which underpins the framework for analysis in this thesis.

For Dean (1999:3) “analytics of government is concerned with thought as it becomes linked to and is embedded in technical means for the shaping and reshaping of conduct and practices in institutions”. He maintains that his approach emphasises the *how* of governance in contrast to the traditional governing question of “who rules?” (p29). He contends that governmentality considers government a regime, in the sense that it is a planned way of doing things. His interest, therefore, lies in the way we “cure, care, relieve, punish, educate, train and counsel” as a way to understand governance (p30). If, under Foucault’s thinking, practice is knowledge, then it is possible to assent the claim that “governance always involves knowledge” (Hunt and Wickham, 1994:87). Dean’s Analytics of Government provides a framework to understand how this knowledge emerges.

Dean’s (1999:27) approach begins with the “identification and examination of specific situation in which the activity of governing comes to be called into question”: the problematisation of governance. He then draws upon four areas for further examination: visibilities, techniques and practices, knowledge and identities. Russell and Frame (2013:95) entitled these “operationalisation of rationalities through practices” but for

simplicity these areas are entitled the ‘elements’² of governmentalities in this thesis. These elements are derived from Dean (1999: 30- 32) as follows:

- i) visibilities: objects, actions, areas, people that present a picture of what is to be governed.
- ii) techniques: “mechanisms, procedures, instruments, tactics, techniques, technologies and vocabularies” (p31) through which governance is practised
- iii) knowledge: “forms of thought, knowledge, expertise, strategies, means of calculation or rationality” (p31) that are used to practise governance
- iv) identities: “statuses, capacities, attributes and orientations” (p32) of those who govern and those who are governed

Finally Dean connects these elements to the concept of ‘utopia’ where “governance is presumed to have a desired end and can meet that end” (p33). This utopian element is important, for this links to Foucault’s idea that those who govern and are governed always retain a degree of freedom to challenge dominant practices. As a consequence, as Walters (2012:12) notes, this means “other ways of conducting oneself and others always remain possible”. This critical angle is why governmentality is focused less on individuals and institutions but rather on the reinforcement of norms and practices in society, as modern political power operates not through laws and sovereignty but rather through “discourses of truth” (Foucault, 1997:543). Therefore, in governmentality, opposition to dominant regimes comes through the critical reflection of the emergence and use of knowledge of governance (Ettinger, 2011).

General governmentality takes this reasoning and tries to apply it to an analysis of a particular regime. For Rose et al. (2006:84) analysis of governmentalities is an approach that:

“ seeks to identify... different styles of thought, their conditions of formation, the principles and knowledge that they borrow from

² ‘Elements’ was chosen as a descriptor because, like their chemical equivalents, the governmentality elements are distinguishable and yet linked; only taken together can they suggest a rationale of governance; and different combinations will produce different results.

and generate, the practices that they consist of, how they are carried out, their contestations and alliances with other forms of governing”.

This perspective goes some way to explaining why governmentality is often associated with the term ‘the art of government’ in which the richness and nuance of governance processes are investigated beyond identification of the role of institutions and laws of ‘government’. It also presents governmentality as a useful analytical tool to be applied across a variety of subjects, scales and political contexts, as it has been, with studies appearing in multiple academic disciplines and fields.

Some criticism has emerged of the way general governmentality has been applied in certain studies. Rose et al. (2006) suggests that there has been an over attention paid to advanced-liberal explanations of governmentalities: a reinforcing phenomenon that has partly emerged from, and partly contributed to, the popularity of this form of governance within academic literature (Walters, 2012). Rose et al. (2006) suggests that initially advanced-liberalism was used as a heuristic device to understand modern governmentality but they suggest that the concept has now been formalised to the extent that almost all analysis of governance identify aspects of neo-liberalism. They admit this rationale of governance can be found in most modern societies but suggest that it is too simplistic to see it in all “contemporary arts of governance” (p97). Other authors have made similar critiques about the often singular conclusion of general governmentality studies (Dowling, 2010; McKee, 2009).

The ubiquity of advanced-liberal explanations can be attributed to its connection to Foucault’s more specific understanding of governmentality. This thesis predominantly uses a *general* application of governmentality, however, the details of specific understandings of governmentality has so influenced this approach, particularly through the identification and classification of defined concepts, it is also necessary to further elaborate on what is meant by a *specific* application of governmentality.

3.2.2 Specific Governmentality

The concept of specific governmentality applies to two ideas: Foucault’s explorations through a genealogical review of the emergence of the state as the main focus of

governance activities and the analysis of the emergence of liberalism in modern governance. Summaries and elaborations of these approaches to governmentality can be found elsewhere (see Rose and Miller, 1992; Darrier, 1999; Dean, 1999; Walker 2012). The important feature of these debates for this thesis is that they have contributed much of the vocabulary and conceptualisation that is used in *general* governmentality studies (Walters, 2012). For example sovereign, disciplinary, bio, and liberal power all feature in analyses of governmentality and so each of these concepts requires further elaboration.

According to Foucault, governmentality began to emerge at the end of the 18th Century when sovereignty as a divine “right to decide life and death” was replaced with the goal of “fostering life or death” (Foucault in Rainbow: 1984: 261). At that time the population began to be seen as social beings rather than subjects, and power became less about protection of territory and more about the security of a collective entity of people. The move from sovereign power to more diverse concepts of political power is central to Foucault’s genealogical work; as sovereignty became less concerned with divine rights, so it became more closely linked with laws (Dean, 1999). As sovereignty became problematised as a form of governance, so emerged the idea of ‘the art of governance’ where the goal became to consider new techniques of governing that moved beyond “the imposition of laws” (Dean, 1999:107).

These new techniques initially formed in what Foucault described as ‘technologies of self’. The concept of technologies has been widely used in governmentality, often interchangeably with techniques. In this thesis the latter is taken to mean a practical action driven by a particular aim. Technologies are envisaged as groups of techniques. Foucault claimed that technologies of self were:

“techniques which permit individuals, by their own means, a certain number of operations on their own bodies, their own souls, their own thoughts, their own conduct and this in a manner to transform themselves, modify themselves, and so attain a certain state of perfection, happiness, purity and supernatural power” (Foucault in Callinicos: 2007:284).

These were more subversive techniques of governance than traditional legal constraints where individuals were trained through a system of penalties and rewards to exhibit certain behaviours, which manifested in social norms and were reinforced through surveillance. Foucault characterised this approach as ‘disciplinary power’ which he described as a “modest suspicious power” (Foucault in Hunt and Wickham, 1994:20).

The focus of *disciplinary* power is on the individual. In contrast, as governance began to focus on the population as a group for collective advancement, so the forms of knowledge required for such an approach became shaped and ‘biopower’ emerged. Ettinger (2011:546) describes *biopower* as the “mechanisms that are directed to population in the aggregate”. The security of the population became important and statistical analysis that could be extrapolated to larger groups became a prominent feature of the art of governance. As a consequence, in contrast to ‘*sovereign power*’ that emerges through laws, *biopower* is found in societal norms, internalised by individuals. Taylor (2011:44) suggests that the links to societal norms as a technology of governance has led to some confusion in Foucault’s work on the distinction between *biopower* and *disciplinary* power. Debates on this issue are not material to understanding this thesis, and what should be taken from these concepts is the reinforcement of the idea that governance studies should focus on technologies of governance, as well as the institutions of government themselves.

The most recent development in governmentality of the state has emerged through the concept of liberal governmentality, which is also the particular construction to which Foucault devotes most of his energy. Liberal governmentality emerges with the development of “political economy” as the “major form of knowledge” used in governance (Foucault in Walters, 2012:29). It takes as its problematisation of governance - the idea that we could be “governing too much” (ibid:30) and so it focuses closely on governing for freedom. The advent of liberal governmentality and the spirit of openness moves governance beyond the state and introduced new forms of natural laws including the market economy. Policing and security is no longer linked solely to disciplinary power, but instead is used to prevent deviation from this “self-balancing system” (Walters, 2012:34).

Walters argues that Foucault draws a distinction between liberal governmentality and neo-liberalism, with the latter concept disregarding the naturalism of more traditional liberal political economic thought, suggesting active choice in the promotion of advanced-liberal ideas in economic governance. Advanced-liberalism has been typified widely as the dominant rationale of today's governance practices. This approach sees a problem with limits to the idea of a free individual and so utilises the technique of marketisation to expand into new territories of governance. Advanced-liberalism is promoted throughout the "technologies of citizenship" (new spaces for governance); "technologies of agency" (the setting of measurable objectives rather than prescribed processes); and "technologies of performance" (benchmarking, comparison and best practices) (Russell and Frame, 2013:96). As a consequence, advanced-liberalism has often been taken to have as its goal 'governance at a distance'.

Whilst some authors note that advanced-liberalism presents as a "spectrum" of governmentalities which manifest differently "depending on context" (Keskitalo et al. 2012:437), others have become increasingly critical of the focus on this understanding of governmentality. Dowling (2010:493) suggests that within geography literature there is increasing "scepticism towards the coherence of neoliberalism as a programme of rule". Rose et al. (2006:97) also argue that it has become a "cookie-cutter typification". As such, some authors have suggested that governmentality literature now artificially underplays the role of the state, law and the explicitly political (McKee, 2008; Golder and Fitzpatrick, 2009; Walters, 2012).

These restrictions on conceptualisations of governmentality have been attributed to ill-considered expansion of Foucault's genealogical method which has focused research on the very recent history of political thought (Walters, 2012) as well as the avoidance of empirical realities of governance in an effort to avoid focusing on "systems of rule" (McKee, 2009:473). This is seen as problematic because it presents governmentality as a "completed project" (Rutherford, 2007:300) that limits opportunities for human agency and resistance (McKee, 2009). These critiques have led to an increased volume of work which focuses not on whether governmentality is *specific* or *general* but how governmentality studies should be conducted.

McKee (2009:481) believes a poorly constructed study of governmentality: “inadequately theorises resistance and sanitises politics out of the policy process”. She argues that a “realist governmentality” which examines rationales of governance in empirical context can show opportunities for “critical space” and identify critical voices (ibid). She suggests that studies should look beyond key government documents to ask “how these political ambitions have been realised in practice” (p474). As a consequence she promotes the idea of “complementing discursive analysis” with “localised empirical accounts of actual governing practices” (p478) arguing that focus on text as evidence does not represent real life.

Rutherford (2007:302) also suggests that messier governmentality analyses are needed to allow us to “disturb common sense notions about power and resistance and initiate a process of rethinking of how one might take up environmental issues” and Dowling (2010:493) argues that taking a sceptical approach to advanced-liberal governmentalities can “offer intriguing signposts for those interested in creating alternative futures”. As a consequence, this thesis not only adopts a *general* governmentality perspective but does so in a reflective, empirical and sceptical way. Section 3.4 (p91) will explore the methodology of governmentality used in this thesis in more detail. However, first attention is paid to how governmentality has been conceptualised, applied and critiqued in relation to understanding governance of the environment.

The next section explores governmentality as it has been used to identify rationales in environmental governance. The delineations of *specific* (Ecogovernmentality) and *general* (Environmentalities) are used but with the underlying perspective that what is important in this thesis is not what type of governmentality is identified or promoted but rather how governmentality can be used to understand the governance of the environmental issue of ZW in Scotland. In this sense a focus is also placed upon how the governmentality studies of the environment have been conducted.

3.3 Environmental Governmentality and this Thesis

The concept of governmentality has been used to make sense of the management of environmental problems in too many studies to cover in any detail in one chapter. These

studies broadly can be argued to apply governmentality in both a *general* and a *specific* way; however, many studies are not explicitly concerned with aligning their research to bigger governmentality narratives. As a consequence, it is difficult to find a common thread amongst the collection of research which labels itself environmental governmentality. This section of the chapter not only offers a review of current environmental governmentality research but also constructs a framing through which sense can be made from the links between these literatures. To this end, it categorises environmental governmentality studies in three ways: Ecogovernmentalities, Environmentalities, and Governmentality for SD and argues that each of these applications under these applications can be used as part of an “analytical toolbox” (Rose et al. 2006:99) of environmental governmentality.

A number of studies have used the environment as a case to expand Foucault’s specific meaning of governmentality. It has been used in its genealogical sense to shed light on the history of environmentalism (e.g. Darrier, 1999; Rutherford, 1999) but also to highlight the expansion of advanced-liberalism in environmental governance (Luke, 1999; Fletcher, 2010) and SD (Luke, 2005; Summerville et al. 2008). Although less attentive to Foucault’s original project, other studies have sought to place governmentality of environmental issues within explanations of the rationale behind a larger narrative of modern environmental governance, highlighting the components and developments of specifically named governmentalities (Oels, 2005; Bäckstrand and Lövbrand, 2006; Methmann, 2011). These studies utilise and build upon Foucauldian concepts such as biopower and liberal governmentality and they often apply useful heuristics to clarify governance rationales in an empirical setting. This research project labels these discussions Ecogovernmentalities.

Elsewhere governmentality is adopted analytically to make sense of environmental governance in particular empirical settings. Environmentality is the approach of identifying “the knowledges, politics, institutions and subjectivities that come to be linked together with the emergence of the subjectivities of the environment as a domain that requires regulation and protection” (Agrawal, 2005a: 226). This approach was developed in response to the perceived myopia of environmental governmentality studies to advanced-liberal explanations of governance rationale (ibid). Through Environmentality, Agrawal (2005a) attempted to find an alternative framing to offer

insight into powers that operate outside of “Western Modernity” (p219). As a consequence, the concept of Environmentality is readily seen in relation to research conducted in the developing world, with Agrawal’s (2005b) own work focusing on India. However, although the term does not appear in all governmentality studies, it could be suggested that many studies have taken on the spirit of Environmentality by trying to expand understandings of environmental governmentality beyond advanced-liberalism. As a consequence, in this thesis Environmentality is taken to mean an analytical approach to governmentality, rather than referring specifically to Agrawal’s (2005a) framing.

Confusingly some of the studies that could be classified as providing Environmentality insight are also those that have been identified as contributing to Ecogovernmentality discussions (i.e. Bäckstrand and Lövbrand, 2006). However, the most apparent contribution to Environmentality debates is that which has been constructed in relation to SD. Many authors have noted that governmentality could be used to identify critical intervention points to encourage more sustainable governance (i.e. Oels, 2005 Rutherford, 2007; and Frame and Bebbington, 2012). This perspective has led to a new application of governmentality in understanding environmental governance, where some have linked governmentality to additional research on the requirements of SD governance (i.e. Frame and Bebbington, 2012, Russell and Frame, 2013). These papers have been categorised in this thesis as attending to Governmentality for SD.

The next three sub-sections expand upon the categories of Ecogovernmentalities, Environmentalities, and Governmentality for SD; reviewing the contributions and limitations of each of these debates in constructing environmental governmentalities in this thesis.

3.3.1 Ecogovernmentalities

This sub-section focuses on studies that have presented and explained named environmental governmentalities. These Ecogovernmentalities are often linked with heuristic elements which make them easily identifiable in other empirical settings (See Box 3.1 on page 76). Two strands of discussion have emerged in this category: that which relates directly to the governmentality project of Foucault, and that which applies

governmentality as a more general lens to make sense of environmental governance. This subsection reviews both.

Although Foucault was not directly concerned with the environment, some have extended the concept of biopower to include the environment as an intrinsic component of human life (Rutherford, 1999, Darrier, 1999). Rutherford (1999:37) argues that knowledge rationale behind modern environmental policy has closely mirrored the path of contemporary biopolitics; suggesting that ecology is to the modern environmental movement as medical science was to the development of biopower. He uses a genealogical approach to track the progress of ecological governmentality, arguing that environmental problems emerged originally in the 18th Century with the development of biological disciplines as the “science of life” (p 51). He suggests that population increase of Europe and the development of an international economy has further promoted the conceptualisation of the environment as a global issue (ibid).

Rutherford (1999) says that expert knowledge and scientific discourse has problematized the environment as an issue of security. He highlights a correlation between the growth of global environmental problems and the expansion of “big science” (p 56). He suggests that “regulatory ecological science does not so much describe the environment as both actively constitute it as an object of knowledge and through various modes of positive intervention, manage and police it” (ibid). His contribution to discussions of Ecogovernmentality is basic, in that he shows the development of the rationale of environmental governance relates to the governmentality seen elsewhere in society.

Box 3.1: Summary of Elements of Ecogovernmentalities

	Green Governmentality	Ecological Modernisation	Civic Environmentalism	Global Governmentality
Problematization	Failure of government to protect citizens from environmental problems	Failure of the State to adequately govern the environment	The failure of government to promote alternative environmental visions	Climate Change is a global problem which transcends state borders and so requires new forms of governance
Visibilities	Population, Earth as a system of finite resources	New markets, businesses, ecosystem services	Local groups, non-state actors, public assemblies, global North/ Global South	Climate change, transnational actors, the planet, carbon cycle, carbon emitting behaviour
Techniques	Regulations, statistical norms, benchmarks and limits, environmental management, systems modelling	Markets; performance benchmarks; voluntary agreements; collaborative spaces; technological development	Reform: participation, cooperation, voluntary agreements Radical: resistance of global agreements and institutions	Carbon market, international trading regimes, carbon offsets, technical studies
Knowledge	Natural science, environmental science	Neo-liberal economics	Critical thought; specialised expertise; local knowledge	Carbon accounting, economics,
Identities	Individual subjects of particular states, humankind	Individual economic actors	Marginalised groups, NGOs, businesses, research community	Market participants, carbon emitters, leaders (heads of state)
Utopia	Individuals operating within the ecological limits of the Earth	Free markets which encourage environmental behaviour without the influence of the state	<i>Reform:</i> collaboration amongst stakeholders to problem-solve environmental issues <i>Radical:</i> Transformation of consumption patterns and institutional structures	Carbon Neutral Economy

Based on studies by Oels (2005); Russell and Thomson (2009); Bäckstrand and Löwbrand (2006); Methmann (2011)

Additional work has linked environmental governmentality to liberal developments in modern governance. Luke (1999) connects the idea of biopower to ecological governmentality, arguing that the foundations of ecology exhibit elements of rationality but also link closely to issues of national resource use. Luke (1999:146) also finds elements of disciplinary power in ecological ethical practices, which he argues “centre on establishing and enforcing ‘the right disposition of things’ between humans and the environment” and involve the adoption of means of measuring, monitoring and managing the environmental system. This he claims sees “the environment [emerge] as a ground for normalising behaviour” (p149) and thus justifies the need for more effective policing.

He expands this idea to later work (Luke, 2005:230) where, using analysis of corporate documents, he argues that SD has emerged as the economic arm of environmental discourse and that the “safety” and “security” aspect of SD offers a new theme for economic interventions. He suggests that SD has manifested in “a social movement for greater commodification working both from above and below” (p233). He believes that the focus on SD as a discourse for environmental protection obscures the real agenda of SD contending that “ecological sustainability boils down to a new form of economic rationality to remake world politics” (p232).

Foster (2008:445) also suggests that environmental legislation represents an extension of technologies of governance for the environment “to construct and control social power relations in the service of capitalist economic regimes and the global expansion of those regimes”. Her work on UK environmental legislation takes a strongly genealogical perspective and she argues that it extends the reach of liberal governmentality. Summerville et al. (2008) also conclude in their article on SD and community participation that the inherent “good” association with SD and participation, means that the concepts frequently “evade” critical reflection and represent in practice the goal of “governance at a distance” (p15).

The later work of Luke (2005) and the research of Foster (2008) and Summerville et al. (2008) speak to an understanding of governmentality that links the concept closely to the idea of advanced-liberalism and it could be said that this line of discussion offers the most crossover with mainstream governmentality debates. However; it is the early study

of Luke (1999) where he labels the links between environmental governance and biopower as 'Green Governmentality' that appears to have had the most impact amongst environmental governmentality studies. Green Governmentality arguably presents the first taxonomy of environmental governmentality. This thesis has labelled these taxonomies 'Ecogovernmentalities'. Four Ecogovernmentalities identified in the literature are used in this thesis: Green Governmentality; Ecological Modernisation; Civic Environmentalism and Global Governmentality.

Green Governmentality

Oels (2005:194) describes Green Governmentality as "the manifestation of biopower in the environmental field". Although she and others (i.e. Russell and Thomson, 2009) offer clarification of the idea, the concept originated in the work of Luke (1999) who argues that Green Governmentality can be identified in three ways: Geopower; Eco-knowledge and Envirodisciplines. Using US political discussions on the topic, he suggests that the environment has been framed within a "national security issue of wide resource use" (p124). This he argues has resulted in a framing of the environmental harm as "civil disobedience" and using the Earth as a limited resource, expands material security beyond national borders (p125). He terms this this idea 'Geopower'.

He simultaneously maintains that this Geopower is supplemented by forms of Eco-knowledge. He argues that with the birth of sustainability discourse, "entirely new identities built around collective ends" were developed (p134). Luke contends that SD discourse claims that these ends can be known, including "how to define aspirations for a better life, what constitutes basic needs, when to manage economic growth, and where to organise environmental resources" (p138). He argues that SD has fed "delusions" of environmentally friendly practices including "environmentally responsible trade, green industrialisation [and] ecologically sustainable commerce" (p141).

Nevertheless, Luke acknowledges that many concepts contained within SD are interesting and yet, he suggests, many of these ideas have not been implemented. He argues that this lack of development is a consequence of 'Envirodisciplines' (those disciplinary practices which consider the environment as an economic space). Furthering this concept, Oels (2005) highlights the indicators of individual environmentally-friendly behaviour and global scientific assessments, whilst Russell

and Thomson (2009) identify populations as central to Green Governmentality. In addition both papers (and others i.e. Bäckstrand and Lövbrand, 2006) focus on big science as a key component of Green Governmentality. Luke's (1999) argument is that this big science is a consequence of Geopower which encourages both a focus on individuals and conceptualisation of the Earth as a whole.

Although she recognises Green Governmentality in her own study of climate change governance, Oels (2005) criticises Luke for failing to adequately consider the economic aspects in environmental discourse (although as discussed on p77 of this thesis, Luke's (2005) later work does seem to address some of these critiques). Oels (2005) identifies Ecological Modernisation as an additional discourse in environmental governance through which discussion of economic aspects of Ecogovernmentalities are readily identified.

Ecological Modernisation

Oels (2005) argues that Ecological Modernisation focuses heavily on the market with discourse centred on technological solutions, the use of market mechanisms and pollution as economic inefficiency. Bäckstrand and Lövbrand (2006:68) summarise the goal of their "Eco-Modernisation" governmentality as finding cost-effective market solutions to environmental problems. As Green Governmentality uses biopolitics as its basis for understanding, Ecological Modernisation has relied heavily upon governmentality of liberal government. Dean (1999: 99) describes liberalism as "observing those natural and economic laws that provide security and subsistence and beyond this, leaving men free". In this sense the Ecological Modernisation encourages the use of the market within environmental limits, with self-regulation a noted feature of the discourse (Neale, 1997). Whilst Luke (1999) does give a nod towards "ecosystem services" in Green Governmentality, the importance of cost-effectiveness of saving the environment in Ecological Modernisation is far more pronounced.

It is sometimes difficult to differentiate between ideas of Ecological Modernisation and Green Governmentality in the literature and Oels (2005) acknowledges that her dichotomy is somewhat constructed for the purpose of analysis. She suggests that a variety of governmentality forms can be found in her research of global climate governance. Other studies have also identified the presence of more than one

Ecogovernmentality within an empirical setting (i.e. Russell and Thomson, 2009; Frame and Bebbington, 2012). In their study of forestry and climate change Bäckstrand and Lövbrand (2006:69) suggest that “the green governmentality and ecological modernization discourses are in several respects both in conflict and mutually reinforcing”. The idea that multiple governmentalities can be identified in one setting has been readily supported within environmental governmentality discussions (Rutherford, 2007).

Oels (2005) was the first – and remains one of the most influential studies – both to use Dean’s (1999) Analytics of Government approach to make sense of the rationales behind environmental governance, but also to label multiple Ecogovernmentalities within one study. She concluded her research by calling for more empirical analysis to build on the governmentality forms identified from the genealogical works of Rose, Dean and Foucault which she uses to construct her analysis. This suggestion for future research echoes claims made in mainstream governmentality literature to move beyond advanced-liberal explanations of governance rationale. Bäckstrand and Lövbrand’s (2006) Civic Environmentalism offers one alternative to Ecological Modernisation and Green Governmentality.

Civic Environmentalism

In their empirical work on Clean Development Mechanism (CDM) forestry projects, Bäckstrand and Lövbrand (2006) recognise the occurrence of Green Governmentality and Ecological Modernisation alongside a new form of governance rationale which they term “Civic Environmentalism”. They consider Civic Environmentalism a critical response to governance which focuses on North-South equity and local participation, but acknowledge that it is a peripheral discourse in forestry debates. They argue that Civic Environmentalism offers “radical and more reform-orientated narratives that challenge and resist the dominance of” Green Governmentality and Ecological Modernisation” (p124).

For Bäckstrand and Lövbrand Civic Environmentalism is a bottom-up discourse which concerns stakeholder engagement. They recognise that the discourse is “neither homogenous nor uncontested” and suggest that it often sits awkwardly between reform and radicalism in response to the capitalist economy (p56). On the one hand Civic

Environmentalism encourages diversity of opinions and knowledge in international debate, whilst on the other it represents a “deeply sceptical” view of stakeholder governance as a means to challenge dominant discourse (ibid). They suggest that Civic Environmentalism offers a place for radical critique but question its ability to interact outside “academic policy debates” (p71).

Summerville et al. (2008) also focus on the discourse of community participation within their governmentality study of SD policies in Australia. Like Bäckstrand and Lövbrand (2006), they find evidence of an alternative participatory SD governance and they note that it claims to provide “empowerment and capacity building for participation” (Summerville et al. 2008:9). However, rather than constituting a new governmentality they suggest that the predefined and controlled role of stakeholders in policy renders participation a technique of government designed to encourage the advanced-liberal goal of ‘governance from a distance’. From this perspective it could be argued that Civic Environmentalism may not be as far removed from advanced-liberal governmentalities as might be expected. On the other hand it could also speak to the idea that identification of Ecogovernmentality is often a messier process than the delineations in the literature might suggest and that overlap between Ecogovernmentalities will occur. This claim is further supported in consideration of the final Ecogovernmentality used within this thesis: Global Governmentality.

Global Governmentality

In his study of a ‘green’ World Bank Goldman (2001) suggests that transnational agencies have come into being to oversee the governance of new territories. He recognises that the discourse surrounding the use of these transnational governance techniques is conflicting. He appreciates the place of organisations like the World Bank but also highlights the place of “alternative globalisation-from-below politics” where voices otherwise unrepresented at international level, come together to speak as one: for example “the rural poor” (p518). He suggests that more work is required to understand this alternative governmentality. In contrast, Foster (2008:545) suggests that Global Governmentality shows that classification of environmental concerns as “everyone’s problem which transcends the boundaries of the state” has extended the concept of neoliberal governmentality by expanding the responsibilities of the “individual”.

The concept of Global Governmentality which is primarily used in this thesis is that presented by Methmann (2011). He uses carbon accounting to consider the links between global concepts and individual behaviour. Again looking at the CDM he argues that “carbon markets and... carbon professionals” show “an apparent disappearance of the state” by allowing governance of environmental behaviour at a distance (p17). Global Governmentality differs in that he maintains that it can only exist to the extent that it draws up a “global polity” (ibid). He suggests that this Global Governmentality is useful for understanding global climate issues but he also explicitly notes that this governmentality might be “helpful to elucidate in some cases and less helpful for others” (p18).

The argument that alternative explanations of governmentality can provide varying usefulness to understand different issues have lead others to call for the continued consideration of discourses within environmental governance (Goldman, 2001; Bäckstrand and Lövbrand, 2006). Agrawal (2005a) argues we need to move beyond Western Modernity conceptualisations of environmental governance. Each of these arguments is based on the critique that current understandings of Ecogovernmentality do not fully capture rationales through which the environment is governed. There is a danger that relying solely on the use of existing Ecogovernmentalities can encourage the myopia currently witnessed in other governmentality studies in relation to advanced-liberal explanations. This critique of Ecogovernmentalities is overcome in this thesis by drawing from the more empirically focused analysis of the Environmentality literature.

3.3.2 Environmentalities

The concept of Environmentality was originally coined by Agrawal (2005a). He argues that it is “a useful lens to focus on swirling debates regarding public-private boundaries; the role of communities and states in environmental control; appropriate goals of environmental management; and discussions about resistance, domination and subjectivity” (p222) all of which relate well to the aims of this thesis. Agrawal states his primary purpose is to explore the role of governmentality in the making of subjects but in doing so he adopts an analytics of Environmentality approach in which he undertakes a genealogical study of shifts in environmental government in India. His aim to look for

answers beyond the explanations of institutions and identities found in more mainstream political-ecological writing.

Much of Agrawal's *new* approach is based on his perception of the ignorance of political ecology and environmental politics in understanding the ecological subject. He argues that the failure to consider the construction of environmental subjects can often result in foregone conclusions about the presence and force of Western neoliberal ideas in shaping environmental governance. He suggests that investigation into "how people understand the environment and relate to it, how new knowledge about the environment shape such understandings, and how changing institutions, politics, and subjectivities play a role in ecological practice" is needed to bring new light to environmental governance (p215). He proposes that governmentality can provide an "analytical optic" through which to understand these shifts (p219). This clearly speaks to a *general* conception of governmentality.

For Agrawal, Environmentality is governmentality of the environment in that "it refers to the knowledges, politics, institutions and subjectivities that come to be linked together with the emergence of the environment as a domain that requires regulation and protection" (p226). He offers a framework through which to make sense of this Environmentality which aims to track "expert knowledges"; consider power as "social practice", looks to institutional reinforcement of these powers through regulations; and focus on the "behaviours that the regulations seek to change" (p229). This "analytics of Environmentality" (p201) was not used as a framework for analysis in this thesis as it is primarily directed towards understanding the formation of the environmental subject rather than the wider appreciation of governmentality that can be developed through Dean's (1999) Analytics of Governmentality.

Agrawal (2005a) makes no reference to Analytics of Governmentality, and yet the two approaches seem remarkably similar. Agrawal highlights the importance of 'how' questions in understanding governance, with Dean (1994:29) also emphasising the questions of "how do we govern?". Dean also considers the importance of the formation of identities which speaks to Agrawal's goal of understanding the creation of the subject in governance. Most notably, Dean also rejects the idea of a "global position" arguing that governmentality provides critique by "removing that which is taken for granted"

(1999:36), a claim which Agrawal echoes in his desire to avoid the totalising explanation of what he sees as Western liberal thought. As a consequence this thesis extends the phrase Environmentalism to mean any analytical framing of governmentality of the environment.

The literature review suggests that Dean (1999) is one of the most popular analytical frameworks used to understand governmentality of the environment (i.e. see Oels, 2005; Russell and Thomson, 2009; Frame and Bebbington, 2012). This thesis uses Gouldson and Bebbington’s (2007) framing of Dean’s Analytics of Government (See Box 3.2 on p84). Although this thesis does not use Agrawal’s (2005) analytical framing, it does support his justifications for using an Environmentalism approach. By focusing on the empirical case and looking beyond existing explanations of governmentality, an Environmentalism approach overcomes the criticism that governmentality stops with advanced-liberalism.

Box 3.2: Governmentality Framework for Analysis

Problematisation	Identification of an issue to be governed	
Regimes of Governing	Visibilities	Created by governance processes and by the use of particular techniques
	Techniques/ Practices	Used to achieve the governance (and which may create visibilities, knowledge, and identities)
	Knowledge	Generated by and used within governance processes
	Identities	Which emerge from and support governance processes
Utopian Ideal	The aim towards which governance is directed, as well as the belief that governance is made possible by a regime of governing	

Gouldson and Bebbington (2007:12) based on Dean (1999)

Most of the studies discussed in the Ecogovernmentality category also call for identification of new governmentalities. Oels (2005) acknowledges that governmentalities for climate change go beyond her dichotomous pairing of Green Governmentality and Ecological Modernisation and even those studies which identify alternative governmentalities argue for the continued consideration of additional discourses within environmental governance (Goldman, 2001; Bäckstrand and

Lövbrand, 2006). This thesis suggests that Environmentality is an approach that can help achieve that goal.

Moreover, Environmentality also links to the idea that governmentality should offer “an empirical mapping of governmental rationalities and techniques” which are “part of an analytical toolbox” (Rose et al. 2006:99). This is considered important if governmentality is to be used to help identify opportunities for sustainable interventions. Dowling (2010:493) suggests that governmentality that goes beyond neoliberal explanations can provide insight for those who are interested in “alternative futures”. Focus on the existence of more contextualised governmentalities can also help identify “critical spaces” (McKee, 2009:480), responding to critiques that governmentality type studies should go beyond descriptions of dominant modes of power which allow little room for resistance.

Furthermore, it has been suggested that if governmentality is about how to govern, then it must be inventive and go beyond critique (Gordon, 1991). This thesis suggests that Environmentality opens up analysis to allow this critical reflection to occur but that an additional step must also be undertaken to identify the possibilities for intervention. This speaks to Sneddon et al.’s (2006:264) calls for critical SD research where “actually existing environmental governance institutions are evaluated and reformed based on their supporting norms”. As a consequence the final identified debate within environmental governmentality that is considered relevant to this thesis builds upon these new conceptualisations of governance rationales and links to the idea of governmentality as a framing to make sense of potential interventions to encourage sustainable governance. In this thesis, this approach is termed Governmentality for SD.

3.3.3 Governmentality for Sustainable Development

It would be fair to classify Governmentality for Sustainable Development (SD) as an emerging discussion. On the other hand it does play a role in responding to the critiques of governmentality discussed previously in this chapter in that Governmentality for SD actively attempts to both identify and cultivate new understandings for the way we govern the environment. Governmentality for SD is a spectrum, with the work of Russell and Thomson (2009) presenting a more modest evaluation of the possibility of

and potential barriers to a Governmentality for SD, whilst Frame and Bebbington (2012) offer a more radical framing of what Governmentality for SD might look like. Other articles focus on techniques that might encourage Governmentality for SD with explicitly expressing fully their conceptualisation of this idea (Frame and Brown, 2008; Russell and Frame, 2013).

In their study of Scotland's national strategy for SD Russell and Thomson (2009:242) found that many SD indicators "were the legacy of past government programmes". They used Oels' (2005) framework and Dean's (1999) 'Analytics of Government' to develop an understanding on indicators for SD in Scotland. Russell and Thomson (2009:327) found that visibilities for SD often "appeared to be imbedded within the issue to be governed and historic governing practices rather than any overarching SD rationality" however, they also suggested that many of the sustainability indicators were techniques "designed to bring about a systemic change in the collective knowledge and understandings" in Scotland's attempts to "transcend its current unsustainability". This led them to conclude that SD indicators can both capture and exclude visions for sustainability. This supports a hypothesis that techniques for SD are promoting an alternative governmentality. Earlier work by Frame and Brown (2008) suggest that "post-normal technologies" are examples of these sorts of SD promoting techniques.

Frame and Brown (2008:226) argue that these technologies are "interventions for the creation and use of knowledge about sustainability, which redistribute and disburse responsibility for environmental, social and cultural stewardship onto broad-ranging groups of stakeholders". Although they identify techniques used already in post-normal science they claim that "existing governance arrangements and structures are ill-equipped" to cope with post-normal techniques. They suggest that extended-peer communities, agnostic processes and ecological citizenship (see Box 3.3 p87) could create "dialogic fora" (p237) to "facilitate the development" of post-normal technologies in SD governance (p233).

Box 3.3: Post-Normal Governance Techniques

Extended-peer Communities	Groups of stakeholders including those “without formal institutional accreditation” (p233)
Agnostic Processes	Techniques to allow “ideological diversity” (p234)
Ecological Citizenship	The result of “empowering people to be responsive and responsible vis- a-vis sustainability” (p235)

Frame and Russell (2013) take a similar but more empirically focused approach to make sense of technologies of water governance in Scotland and New Zealand. They identify technologies of agency, citizenship and performance which, although framed as SD, appear to support more advanced-liberal rationales. They argue for the expansion of new technologies of governance, particularly those that might encourage interaction between the scientific and policy-making communities. They argue that it is “important to increase the research being made to understand more fully the ways in which technologies can support or hinder change and more longitudinal analysis of achievements would provide more evidence on transitions” (p103) which speaks to the idea of using governmentality as an empirical mapping of government rationale to give insight into areas for possible policy intervention.

Frame and Bebbington (2012) take this one step further. They use Dean’s (1999) *Analytics of Government* to consider the SD strategies of Scotland and New Zealand. Although they conclude that these documents do not present a new form of governmentality, they build on their empirical work by seeking to identify a Governmentality for SD by proposing what such a governmentality could look like. Claiming that problematisations for SD are already clear, they focus on the other elements for their *Analytics of Government*. In an unorthodox approach which they admit is both “normative” and “highly speculative” (p269) they contrast the current dominant advanced-liberal government with their potential “sustainability led governance” (See Box 3.4 page 88). This construction of Governmentality for SD is taken from existing literature and is an encapsulation of their goal to create a concrete plan to achieve SD.

Box 3.4: Potential Future Dimensions of Analytics of Government

	Advanced-liberal government	Sustainability-led governance
Objective	<ul style="list-style-type: none"> The aim of government is to establish markets that guarantee freedom from excessive (state) bureaucracy It governs by using markets as the organising principle for the state 	<ul style="list-style-type: none"> Governance is achieved through resource stewardship as an organising principle for the state Societal governance with Rawlsian notions of justice Future matters as does the present
Fields of Visibility	<ul style="list-style-type: none"> Individuals and social groups as entrepreneurs of themselves Excessive state 'bureaucracy' Markets to be established 	<ul style="list-style-type: none"> Locally driven entrepreneurship Central legislation reduced and heavily decentralised to local level Markets governed by resource availability Extended peer communities/agnostic processes
Technical Aspects	<p>Governs using markets as organising principle (for the state):</p> <p><i>Technologies of Performance</i></p> <ul style="list-style-type: none"> Comparison Benchmarking Best-practice examples Performance Indicators Audit Method Budget devolution <p><i>Technologies of Agency</i></p> <ul style="list-style-type: none"> New contractualism Measurable Objectives <p><i>Technologies of Citizenship</i></p> <ul style="list-style-type: none"> New deliberative spaces 	<p>Governs using resource stewardship and equity as organising principle (for the state):</p> <p><i>Technologies of Performance</i></p> <ul style="list-style-type: none"> Decoupling from economic growth Synergistic benefits/outcomes Ecological footprint/ecosystem services Agenda 21 localism Notion of well-being/social justice Eco-verification <p><i>Technologies of Agency</i></p> <ul style="list-style-type: none"> Polluter pays Precautionary principle <p><i>Technologies of Citizenship</i></p> <ul style="list-style-type: none"> Environmental citizen and communities; thick cosmopolitan <p><i>Post-normal sustainability technologies</i></p> <ul style="list-style-type: none"> Foresight/networking/ dialogic accounting
Forms of Knowledge	<ul style="list-style-type: none"> Competition State Neoliberal economics 	<ul style="list-style-type: none"> Ecological economics (post-autism, eco-feminism) Post-normal science (fuzzy, wicked, clumsy) Role of narrative and new civic epistemologies Resource stewardship with long-term view Deliberative Earth systems science
Forms of Identities	<ul style="list-style-type: none"> Calculating individual Entrepreneur of oneself 	<ul style="list-style-type: none"> Stewardship of global commons/entrepreneur of the Earth (Gaia) Active citizen/consumer/identify via consumption (save humanity, not save the planet)/global citizen/local identity Intergenerational and intragenerational equity

Frame and Bebbington (2012: 268-267)

The Governmentality for SD approach responds to the earlier critiques of both Ecogovernmentality and Environmentality in that it uses governmentality in a way that is potentially transformative and not limited to advanced-liberal conceptualisations of

governance rationale. On the other hand, it does offer a potentially controversial application of governmentality. Rose et al. (2006:98) explicitly advise against using governmentality to create “totalising tendencies replete with the overtones of grand theorizations that explains the transformation of society into something substantially novel”. From this perspective, whilst Frame and Bebbington (2012) give the needed impetus to move beyond existing framings of governmentalities, they perhaps do so prematurely and thus leave themselves open to criticism. Using other empirical studies, three critiques can be levied at the current construction of Governmentality for SD: the focus on academic literature; the problematisation of SD; and the neglect of context.

Frame and Bebbington (2012:268) construct their “Future Dimensions of Analytics of Government” using “inklings” from literature of what is required for SD governance. As a consequence, they argue that Governmentality for SD should be subject to continued revision. It has been suggested that academic constructions of governmentalities often have little presence in empirical studies. Bäckstrand and Lövbrand (2006) found that whilst Civic Environmentalism had a clear role within academic discourse, it played less of a part in political discussions of CDM in forestry projects. As a thought exercise, Frame and Bebbington’s (2012) reliance on academic literature to construct Governmentality for SD is unproblematic, however, if its goal is to aid transformational interventions in SD governance in practice, a stronger grounding in empirical understandings of SD would be beneficial.

The importance of empirical contributions is further supported from other studies that have sought to understand elements of SD governance, where some of the elements identified by Frame and Bebbington (2012) have been linked to advanced-liberal governmentalities. This is most clearly observed in relation to the ideas of localism and community participation, Summerville et al. (2008) argue that Agenda 21 localism has been used to perpetuate advanced-liberal objectives of governing at distance. McKee (2008) also highlights that although community decision-making can be highly visible in a policy domain, empirical research suggests that centralised state programmes and institutions often still significantly shape these community actions.

Moreover, although Frame and Bebbington (2012) claim that the problematisation of sustainability is clear, other studies have shown that SD can be used to describe a

number of approaches. Research has suggested that even where multiple governmentalities can be identified within a policy arena, the more advanced-liberal components or economically focused aspects tend to remain dominant in SD practices and techniques (Russell and Thomson, 2009; Frame and Russell, 2013; Spence and Rinaldi, 2014). This has been particularly identified in relation to Scottish SD policies where governmentality research has suggested that indicators for SD (Russell and Thomson, 2009) and technologies for water governance (Frame and Russell, 2013) both exhibit advanced-liberal explanations. The importance of economics in Scottish SD policies has also been noted in non-governmentality based studies (Ross, 2012, 2015). This links to the final critique of Frame and Bebbington (2012) that they fail to adequately address the contextual aspects that can shape governmentalities in an empirical setting.

Previous empirical studies have suggested that historic governance rationales play a role in shaping approaches to environmental governance (Keskitalo et al. 2012; Russell and Thomson, 2009). Both this research and the research on SD in Scotland would suggest that locational context is very important in shaping environmental governmentalities. However, beyond location, it has also been suggested that the problem context can also prove important in determining governance rationales. Bulkeley et al. (2007:2736) suggest that “analysis of governmentalities demands that attention be paid to how problems are defined”. Methmann (2011: 18) also suggests care must be taken to ensure that governmentalities are not considered “ubiquitous concepts” but are viewed as helpful in certain contexts. He suggests that Global Governmentality is a useful framing for governmentality of climate change because of the international systemic nature of the problem and its link to the easily identified unit of accounting (carbon). This suggests that the nature of sustainability problem under scrutiny is very important in a governmentality analysis.

Their failure to account for empirical context is not fatal to Frame and Bebbington’s (2012) project. Their paper can be seen as a first step in rendering Governmentality for SD a useable concept. Methmann (2011: 17) acknowledges that Global Governmentality both helps understand climate change, as climate change helps understand Global Governmentality. Similarly in this thesis it is argued that Frame and

Bebbington's (2012) Governmentality for SD can provide insights on sustainability issues, so can empirical sustainability issues clarify Governmentality for SD.

This section has identified three different applications of governmentality in understanding environmental governance: Ecogovernmentality, Environmentality and Governmentality for SD. It was shown that there are benefits and limitations to be gained from using each application. Admittedly many studies which have sought to understand the rationale behind governance of the environment have used approaches from all three applications. However, unlike in more mainstream governmentality literature, with the exception of Agrawal (2005a), no studies could be found which explicitly reflected upon their methodological use of governmentality. There was little engagement with the idea that governmentality is a concept that holds multiple meanings. In contrast this thesis seeks to make explicit the use of governmentality as an analytical tool, and the next section will outline the concept as it has been applied in this project.

3.4 Governmentality in This Thesis

This final section of the chapter consolidates the discussions of the benefits and barriers with using governmentality identified from Sections 3.2 and 3.3 to explain how governmentality is used within this research project. Further insights from literature are taken from both within and outwith environmental governmentality and these are used to justify and explain decisions within this thesis. Firstly relevant studies are reviewed to justify the use of governmentality as an analytical framing. Insight is taken from governmentality studies in waste and on policy in Scotland. Secondly explanations are given use of the Framework for Analysis. Particular attention is paid to the empirical work of McKee (2008,2009) who offers suggestions on how to overcome perceived limitations of governmentality studies. The section concludes with discussion of the research aims and contributions of this understanding, framing and application of governmentality.

3.4.1 Contextual Considerations

The importance of focusing on the nuanced empirical case is widely noted in governmentality literature. Dean (1999:20-21) suggests that Foucault's approach to

governmentality was one which “ground itself in the singularity and details of a time and place-specific analysis”. Oels (2005) reflects that it is preferable to focus on the case in hand, rather than to use stereotypes of governmentality. Ettinger (2011:542) also suggests that governmentality studies start by identifying “on the ground” concerns and then expanding to theory.

Nevertheless, a review of existing governmentality studies can potentially prove useful in enhancing rather than forming thoughts on governmentality in a specific empirical setting. It has been shown that governmentality studies reflect historical practices in particular places; in their study of climate change adaptation strategies Keskitalo et al. (2012) show that governmentality reflects previous national policies. As a consequence, the literature review in this section considered governmentality studies of national Scottish Policy. In addition, using Methmann’s (2011) reflections on the links between Global Governmentality and climate change, this contextual importance can also be extended to a particular problem. The literature review also considered governmentality studies of waste. There are no existing governmentality studies on waste governance in Scotland.

Governmentality of Waste

A limited number of studies were identified which used governmentality to understand waste. Hird et al.’s (2014) case study looked at the politics behind the siting of a landfill in Ontario. They predominantly used governmentality to make sense of the visibility of waste within a city setting. As a consequence, it was not considered relevant to this section of the thesis. In contrast, Bulkeley et al. (2007) and Davies (2008) use governmentality to study waste governance at a regional and national scale. All limit their discussions to municipal waste.

In an earlier work Davies (2005) claimed that governmentality could provide a useful framing to make sense of the politics of incineration and waste governance more generally. She expands on this statement in her work *Geographies of Garbage Governance* (2008). Although this book uses the concept of governmentality to make sense of municipal waste governance at a national level in Ireland and New Zealand, and so offers many contributions for this thesis elsewhere, her application of governmentality is reflected more in the research focus than an effort to contribute

directly to literatures on environmental governmentality. Her conceptualisation of governmentality is simple, it is an approach in which the focus of attention is placed beyond traditional institutions of governance and instead upon the goals and techniques of waste governance and the rationalities that underpin these choices. It is a definition of governmentality that sits well with this thesis.

Although Davies adopts an “analytical framework” this framing attempts more to “preserve the conceptual breadth of the term governance and the insights of governmentality” (p360) than contributing directly to governmentality literature. Her framework is a “tripartite approach” which considers i) “policy interventions” ii) “interactions between actors that relate to those interventions” and iii) “the outcome of those interventions” (p59) and she considers it particularly useful for conducting comparative analysis.

At a fundamental level, Davies’ (2008) conceptualisation and use of governmentality is very similar to that used in this project; however, this thesis has used Dean’s (1999) *Analytics of Government* rather than Davies’ (2008) framework. This is because Dean’s approach was found to be clearer, in part because it has been so widely used by other studies and also because he offers a detailed explanation of each of the elements of his *Analytics of Government*. Davies (2008) does not offer the same depth of description and her framework appeared somewhat more ambiguous, particularly in relation to “interactions”. On the other hand, her categorisations of “interventions” was more detailed and so was drawn upon in this thesis’ framing of techniques used in waste governance.

Bulkeley et al. (2007) also use the concept of governmentality in shaping their research on governance of municipal waste in the North East of England. Although Bulkeley et al. (2007) focus on a region, their conceptualisation of governmentality links with the other literature reviewed in this chapter. They identify shifts in rationales of waste governance through ‘modes of governance’. They suggest there are four main modes of municipal waste governance: ‘disposal’, ‘diversion’, ‘eco-efficiency’ and ‘waste as resource’ (p2740). They define a mode of governing as “at once a form or structure, for governing” (the actors involved) and “a process” (the methods of steering policy i.e. regulation) and argue that multiple modes exist can within one issue (p2739). Using a

governmentality analysis they provide a framework for understanding each of these modes in order to both highlight “the structures and processes of governing” and “to recognise the plurality and multiplicity of governing sites and activities” (p2734). They argue that this methodology helps counteract criticisms made against governmentality which suggest that it fails to take into consideration grassroots government, geographical variation in government and “the potential multiscalar nature of governmentalities” (p2738).

The framework of analysis presented by Bulkeley et al. (2007) more closely resembles an Analytics of Government approach than that of Davies (2008). It uses 5 components: governmental rationality (policies and programmes); governing agencies; institutional relations; governmental technologies (examples); governed entities (p2740). Although this allows the identification of their multiple modes of governance, the definitions of these components is still somewhat more ambiguous than Dean’s (1999) framing. Like Davies (2008) focus of comparability between sites, Bulkeley et al. (2007) framework speaks loudly to a geographical objective with a focus on scales and spaces, rather than an interest in contributing to discussions of governmentalities. Arguably an omission from both frameworks is a way of identifying and analysing knowledges (a key concept in governmentality). As a consequence, although also providing insight into waste governance, the framework of Bulkeley et al. (2007) was also rejected in favour of Dean’s (1999) Analytics of Government.

Governmentality in Scotland

In contrast to waste, a number of studies were found which use governmentality in a Scottish context. Focusing only upon those that consider national policies narrows the scope to insights that are relevant for this thesis. Some of these studies (Russell and Thomson, 2009; Frame and Bebbington, 2012) have already featured heavily in this literature review chapter and a full reconsideration of them would be unnecessary. Nevertheless there are aspects of those studies which provide insight into Scottish rationales of governance.

Russell and Thomson (2009) found that indicators within Scotland’s national SD strategy, *Choosing Our Future* (Scottish Executive, 2005) emphasise economic goals, a conceptualisation of SD in Scotland that has been supported elsewhere (see p90 of this

thesis). However, they also suggested that many indicators were historic legacies from past governance practices which were rebranded SD appropriate. Moreover, they highlighted many indicators focused on SD but suggested that those which were most visible were related to measurable targets. This finding suggests the importance of the use of a framework which allows identification of both ways of knowing and visibilities.

Frame and Bebbington (2012) also analysed *Choosing Our Future* and identify a number of interventions based on “action”, “partnership” and “environmental justice” (p262-263). They suggest that “all mechanisms have the potential to bring SD thinking into the underlying machinery of decision-making in government” (p263) however, like Russell and Thomson, (2009) they also found that knowledge within the strategy is strongly linked to tradition “scientific modes of rational analysis” (p264). This further supports the use of a framework of analysis that explicitly considers the importance of knowledge.

Away from SD, the other study which was found to contribute to understanding of governmentalities within a Scottish context is that of Raco (2003) which looks at governmentality discourses in post-devolution Scotland. He argues that devolution was a consequence of “the perceived lack of congruence between the needs and political aspirations of the populations of Scotland and Wales” (p78) and that it gave the opportunity for “the articulation and implementation of alternative agendas” (p79). He concludes that this has forwarded a discourse of entrepreneurialism which has empowered business within the community and that the Scottish Government has moved decision-making away from the Executive towards non-political experts. He argues that in some sectors this has resulted in a “re-awakening of Scottish subjectivities”(p87).

The existing studies on governmentality in both waste and Scotland not only shed light on the particular context in which this thesis is situated, but also further support the methodological decisions made in this thesis. Both Bulkeley et al. (2007) and Davies (2008) conclude that governmentality is a useful way to make sense of waste governance and encourage the use of frameworks of analysis to do this. The studies based in Scotland highlight the importance of knowledge in shaping governmentalities

and so encourage the adoption of a framework which explicitly includes this element. These both suggest that Dean's (1999) Analytics of Government is an appropriate choice. The next section elaborates on how this thesis uses the Dean's approach using methodological insights from other governmentality studies.

3.4.2 Methodological Considerations

This thesis also uses governmentality in a way deemed to be compatible with a Sustainability Science perspective. Section 3.3 (p72) explained that the three approaches of Ecogovernmentality, Environmentality and Governmentality for SD are used in a strategic way. Firstly Ecogovernmentality is used to identify the presence of common governmentalities in ZW, then the Environmentality framing is used to identify specific governmentality to the empirical case of ZW. Finally these are compared with Governmentality for SD to consider where governmentality for ZW is representative of elements thought necessary for SD governance.

Not only is the framework used in a structure compatible with Sustainability Science, but it is also constructed in a way that aligns compatibly with the methodological focus of this thesis, in that insight from multiple sources is used to develop the framing. The construction of the Framework is explained further in Section 4.3.3 (p130) and the accompanying guide can be found in Appendices 3 (p260) and 4 (p269). For the moment it is sufficient to appreciate that the framework constructed by Gouldson and Bebbington (2007) (Box 3.2 p84) was expanded upon and developed to reflect findings from waste literature, and latterly data from this thesis. Other governmentality studies offer less insight into their use of Dean (1999) (e.g. Frame and Bebbington, 2012; Russell and Thomson, 2009; Oels, 2005). These studies also use policy documents alone to identify governmentality. Research elsewhere suggests that this fails to represent the "empirical reality" of governmentality (McKee, 2009:473).

McKee (2009) suggests that focusing predominantly on official documents entrenches the theoretical limitations of governmentality by presenting an abstract view of governance rationales. Instead she advocates the use of a "Realist Governmentality" based on work by Stenson (2005). This approach "advocates complementing discursive analysis of emergent governmentalities with localised empirical accounts of actual

governing practices” (McKee, 2009:478). McKee (2009: 479) contends that a governmentality analysis that goes beyond text recognises “multiple voices”, is “more sensitive to temporal and spacial issues” (p480) and “opens up a critical space” for new ideas (ibid).

Moreover other studies have suggested that using multiple data sources can offer insight into alternative governmentalities. Barnett et al (2008) look at governmentality of consumption and find that the apparently advanced-liberal technique of encouraging ethical consumption seen in policy and academia often rarely emerges in practice. They suggest that this account fails to consider people’s “busy lives and torn loyalties and multiple commitments and scarce resources” (p649). McKee (2009:479) also suggests governmentality often disregards the “messiness” of governance in practice. Barnett et al. (2008:649) argue that this is because governmentality studies often “remain too adverse to treating lay normativities seriously and therefore are unable to recognise the practical resources through which the power relations they set out to analyse actually operate”.

Hobson (2013) has also argued that “environmental citizens” have also failed to emerge in the ways academic readings of policies might suggest. Again, she argues that this is because these approaches have failed to adopt an “empirically informed perspective” (p68). She suggests that other governance analyses have also made the mistake of identifying solutions for encouraging environmental citizenship without considering the empirical realities. On the other hand, she contends that governmentality can provide “a critical lens” to identify “how and why interventions... often contain within them uninterrogated assumptions, rationales and technologies that, in diffuse and complex ways” (p69). Realist governmentality perspectives suggest that governmentality is most useful when applied to an empirical setting using a combination of data sources. This again seems a compatible approach with Sustainability Science, so this thesis uses a combination of interview and documentary data to construct the governmentality of ZW.

3.4.3 Research Aims and Contributions

This chapter has been used to clarify the meaning and application of the concept of governmentality as the theoretical lens of this thesis. Although governmentality has been used elsewhere to make sense of environmental problems, there has been little discussion in the literature about differences in how governmentality has been applied to environmental issues. The literature reviewed in this chapter suggested that governmentality in environmental governance can be categorised in three ways: Ecogovernmentality, Environmentality and Governmentality for Sustainable Development.

Box 3.5: Benefits and Limitations of Environmental Governmentality Approaches

	Benefits	Limitations
Ecogovernmentality	<ul style="list-style-type: none">• Existing studies to provide basis for further analysis• Simple presentation of governance rationales	<ul style="list-style-type: none">• Focus on neoliberalism• Heuristic becomes formalised
Environmentality	<ul style="list-style-type: none">• Goes beyond advanced-liberal explanations• Problem-focused	<ul style="list-style-type: none">• Can be limited to critical evaluation
Governmentality for SD	<ul style="list-style-type: none">• Intervention -seeking• Future-oriented	<ul style="list-style-type: none">• Speculative• Lacks grounding in empirical research

It was argued that each of these approaches can be used to shed light of the rationales behind governance practices in different ways. Each approach has benefits and limitations (see Box 3.5 p98) and so this thesis uses all three systematically. It is hoped that this framing will not only help explain governance rationales in the empirical setting of ZW in Scotland, but will also encourage the identification of interventions to encourage governance techniques more in line with Governmentality for SD. This aspiration is encapsulated in the second aim of this thesis project: *to critically assess the*

governmentality of the ZW policy in Scotland in relation of Governmentality for Sustainable Development.

Addressing this aim with this thesis, it is hoped, will provide an empirical context for Governmentality for SD, which offers clarification on its perceived limitations and potential future uses. Moreover by presenting a clear framework for analysis and its applications as an Ecogovernmentality, Environmentality and Governmentality for SD, the thesis attempts to provide guidance for future empirical studies which wish to contribute to understandings of Governmentality for SD.

As a final consideration, it was also claimed in this chapter that environmental governmentality studies have failed to adequately reflect on the methodological steps required to make sense of governmentality in an empirical setting. It was shown that insight from 'realist governmentality' encourages the use of multiple sources of data (both documentary and ethnographic) to illuminate critical points of resistance in the empirical setting. This thesis argues that appreciation of these opportunities of resistance are essential to identify the potential interventional insights from Governmentality for SD. As a consequence, it is hoped that this thesis not only contributes to existing literature by providing insight into the governmentality of ZW but also strengthens the reflexive application of governmentality as a concept to make sense of environmental governance issues.

4 Sustainability Science: A Pluralist Methodology

4.1 Introduction

“Its scope of core questions, criteria for quality control, and membership are consequently in substantial flux and may be expected to remain so for some time. Nonetheless, ...something different is surely ‘in the air,’ something that is intellectually exciting, practically compelling, and might as well be called ‘Sustainability Science’.” (Clark and Dickson 2003:8060)

A term already used multiple times in this thesis, this chapter clarifies what is meant by Sustainability Science, and how this concept was used to shape the research strategy in this project. Sustainability Science is primarily interested in finding solutions to real world sustainability problems. It is described as problem-driven research which has a strong emphasis on using a plurality of perspectives. As a consequence, it has been noted that a number of methodological approaches can be identified in Sustainability Science research (Kumazawa et al. 2009; Lang et al. 2012; Brandt et al. 2013).

Methodological plurality is often accompanied by claims of ambiguity; Hackett and Rhoten (2009: 410) suggest that “from the perspective of disciplinarians... interdisciplinary research can appear unfounded, illegitimate, transgressive, and fundamentally challenging”. Some authors have responded to these concerns by suggesting that Sustainability Science should become a discipline in its own right (i.e. Komiyama and Takeuchi, 2006; Kumazawa et al. 2009). Others have called for methodological clarification rather than formalisation, arguing that this type of research is “a practice not an institution, and the more flexible, adaptable and open it remains the better its contribution” (Russell et al. 2008:470). This thesis supports the now well-cited claim of Clark and Dickson (2003:8060) that “Sustainability Science is not yet an autonomous field or discipline, but rather a vibrant arena that is bringing together scholarship and practice”. This offers flexibility in constructing the research strategy but does require a transparent discussion of both research methods and research philosophy.

It has been noted that this pluralist vibrancy can present some difficulties to the aspiring Sustainability Science researcher. Kumazawa et al. (2009:101) suggest that “there is no consensus on the underlying question of what is structuring knowledge in Sustainability Science”. Hackett and Rhoten (2009) argue that the lack of structure can prove particularly daunting for early career researchers, suggesting that “disciplines offer reliable recipes for the production of certified knowledge” (p424) whereas interdisciplinarity “demands a leap of faith from the safety of disciplinary patterns into a new sphere of creative collaboration” (p425). Researchers have suggested that these uncertainties can be overcome by adopting a consciously pluralist methodology (Miller et al. 2008, Moses and Knutsen, 2012; Splash, 2012).

Moses and Knutsen (2012:302) suggest that a pluralist methodology requires social scientists to “self-consciously choose among concepts and theories” which “honestly address the complexity at hand and our ability to deal with it”. They state that these conceptual choices operate as a “philosophical ballast” which provides “certainty and objectivity” (p1) in the research process. This chapter outlines the ontological and epistemological concepts and ideas that underpin Sustainability Science; in doing so it is hoped that the “philosophical ballasts” which support this thesis will be made clear.

The first half of this chapter focuses on the research philosophy adopted in this thesis. It begins by presenting what is meant by a pluralist methodology and explaining the terms used to describe this approach found within Sustainability Science literature. Further details are then given on the origins and development of Sustainability Science, with particular focus placed upon the methodological challenges that present in this type of research. It is explained that transdisciplinarity is often promoted in Sustainability Science as a way to overcome these challenges and as a consequence, the section concludes with a reflection on transdisciplinarity and a discussion of its use in this thesis.

The second half of the chapter links the “philosophical ballasts” with the practical implications of the research strategy. It is argued that participatory transdisciplinarity is a difficult goal for a PhD focused on national policy and so more creative ways were used to incorporate alternative perspectives into the research strategy. Further details are given on the data collection and analysis undertaken in this thesis which were used to

form the research strategy. This was based on the triple-stage transdisciplinary research process for Sustainability Science as outlined by Lang et al. (2012). The final section of the chapter considers the implications of using a Sustainability Science approach on the research aims and contributions for this thesis.

4.2 Research Philosophy

Debates over what constitutes knowledge and truth have occupied scholars throughout history and there is still no settled agreement on how (epistemologically) or whether (ontologically) we can understand reality (Moses and Knutsen, 2012:1). Nevertheless ontological and epistemological positions will affect not only what scientists study but also how they conduct research. As Moses and Knutsen (2012:1) note “beneath any given research design and choice of methods lies a researcher’s (often implicit) understanding of the nature of the world and how it should be studied”.

This section outlines the ontological and epistemological position taken within this thesis. Whilst disciplines have traditionally set the knowledge boundaries within scientific research, for Sustainability Science the situation is rather different. In Sustainability Science these methodological positions are not clearly characterised, as it adopts the stance that research should be “defined by the problems it addresses rather than by the disciplines it employs” (Clark, 2007b:1737). This section describes the origin of that objective and explains how Sustainability Science has developed to overcome the challenges that can present from adopting this shifting methodological stance. Before entering into discussion of Sustainability Science it is first necessary to clarify some of the methodological ideas that support this research approach.

4.2.1 Methodological Pluralism: Foundations of Sustainability Science

This thesis presents Sustainability Science as an example of methodological pluralism. Others have specifically noted Sustainability Science’s ontological pluralism (Kumazawa et al. 2009), epistemological pluralism (Miller et al. 2008) and that this type of research actively pursues “a strategy of pluralism” (Splash, 2012:36). Jerneck et al. (2011:70) highlight that this plurality involves bridging the divide between natural and social science paradigms. They note that “differences in ontology and epistemology constitute one of the main obstacles to the integration of knowledge across scientific

disciplines” (p78) and so state that methodological questions are very important in Sustainability Science. Despite this, there is little work within Sustainability Science that frames these contrasting paradigms and so for clarification of these methodological positions it was necessary to return to more general social science literature.

Moses and Knutsen’s (2012) work offers a description and contrast of the positivist methodological views of ‘Naturalism’ with the social constructed reality of ‘Constructivism’. They argue that those who advocate a Naturalist methodology take as their starting point the belief that we can understand and know the world. The goal of such science they say is “to discover and explain patterns that exist in nature” (p8). Constructivism, also attempts to discover and explain patterns in society, however, unlike Naturalists, Constructivists do not believe that these patterns represent reality but rather are our socially constructed perceptions of the world. As Moses and Knutsen (2012:167) put it “for constructivists, the world we observe is, in a sense, a world of our own making”. These contrasting ontological perspectives, they suggest, is why Naturalists and Constructivists have different approaches to uncovering truth, which has profound effect on research design.

Jerneck et al. (2011:77) offer a description of research paradigms inherent in Sustainability Science that seem to expand on these constructions. For Jerneck et al. (2011:77) Sustainability Science must navigate between “problem-solving” science which “takes the world ‘as it finds it’”, and critical theories which stand apart from the prevailing order of the world and asks “how it came about”. This extends Moses and Knutsen’s (2012) idea of Naturalism beyond social science to include the positive constructions of natural science. The idea of Sustainability Science as a bridge between these paradigms speaks closely to Moses and Knutsen’s (2012) framing of ‘Scientific Realism’.

Moses and Knutsen (2012) describe Scientific Realism as a more reflective form of research philosophy. They suggest it is the philosophical standpoint which “blends some of the most attractive features of Naturalism and Constructivism” (p12). Scientific Realism admits that the world offers a complexity which may never be understood by positivist scientific practices. Moses and Knutsen suggest that Scientific Realism considers “good science” as “driven by questions not by methods” (p13) and link it to

“Real World problems” (ibid). Nevertheless, Scientific Realists still believe that these methods are the most appropriate ways available to uncover any level of truth (p13).

Moses and Knutsen criticise Scientific Realism for this faith in the ability of the scientific method to make sense of the world and propose an even more reflective approach to social science research: methodological pluralism. This methodology also offers a link between Naturalist and Constructivist ontologies, recognising the benefits in both (p303). They suggest methodological pluralism goes beyond Scientific Realism, in that the latter seeks to fill the ontological divide between paradigms but still permits researchers to return to their original philosophical positions (p304). In contrast methodological pluralism provides a more creative approach to understanding of the world. In many ways this echoes Max-Neef’s (2005) definition of transdisciplinarity.

This new way of seeing of the world for Max-Neef (2005) is what differentiates transdisciplinarity from interdisciplinarity. Echoing Moses and Knutsen’s (2012) Scientific Realism, he argues that in many instances the use of multiple ways of knowing is a pragmatic approach to find solutions to practical research problems. This “pragmatic interdiscipline” (p7) still predominantly relies on traditional rational scientific methods. He terms this “weak transdisciplinarity”. He contrasts this with an approach to research that encourages knowing and understanding based on reason and relationships. He believes this methodology is “more than a new discipline or super-discipline” and “is, actually, a different manner of seeing the world, more systemic and more holistic” (p15). This holistic angle not only permits the consideration of “what exists?” or “what are we capable of doing?” but also extends to normative discussions of “what do we want to do?” and “why should we do it?” (ibid, p7-8). He terms this “strong transdisciplinarity”. This thesis adopts a Sustainability Science approach that aligns with a ‘methodological pluralist’ or ‘strong transdisciplinarity’ perspective.

Transdisciplinarity is associated with a number of other descriptors (including Mode 2 and Post-Normal Science) and various attempts have been made to discuss the development and create defined definitions for these terms (e.g. Hadorn et al, 2006; Turnpenny et al. 2011; Russell et al. 2008; Jahn et al. 2012; Brandt et al. 2013). Although these ideas are not synonymous they can be broadly construed as a “re-visioning of science” (Nowotny et al. 2001. Chapter 15).

It is suggested that this type of research differs from disciplinary research in that it aims to “address the knowledge demands for societal problem solving” (Hadorn et al. 2006:122) rather than attempting to fill gaps or build knowledge within a particular academic discipline. Functovitz and Ravetz (1993:749) argue that it is not concerned “with the discovery of a particular fact but with the comprehension or management of an inherently complex reality”. In a sense this could be construed as a pragmatic approach to research. Robson (2011: 28) describes pragmatic research as “seek[ing] a middle ground between philosophical dogmatisms and scepticism” where “knowledge is viewed as being both constructed and based on the reality of the world we experience and live in”.

Nowotny et al. (2001: Chapter 15) suggest that within this type of research there is a recognition that “knowledge is inevitably rooted in some set of beliefs” and science is no longer given “special epistemological status”. In this re-visioning, scientific knowledge is complemented with other expertise to enhance creative responses to societal problems (Gibbons et al. 1994). As a consequence reliance on disciplinary boundaries to shape the research strategy is no longer appropriate, instead “the context of application” provides the “intellectual structure”, even if it is admitted that this may only be “in very general terms” and through “heuristic guidelines” (ibid, p22). Within transdisciplinary research traditional disciplinary methodologies will continued to exist. Nowotny et al. (2001: Chapter 15) argue scientific autonomy is a “precondition for scientific creativity” (one of the many knowledges which contribute to transdisciplinarity); however, it “will take on highly localised forms” and “have to be justified in each case and for each individual research project” (ibid).

Like their disciplinary colleagues, transdisciplinary researchers must also undertake critical reflections on their chosen research methods, however, the basis for these justifications rest on the goals of the research rather than being constructed by disciplinary boundaries. Hadorn et al. (2006:122) state that transdisciplinary research “strongly overlaps” with sustainability research and maintain that in SD, the goal of research is to “address a problem field by identifying the diverse dimensions of the question at issues and investigating their complexity, dynamics and variability with regard to how they can be transformed in a more sustainable way” (p125). This thesis

takes the perspective that within Sustainability Science literature a similar understanding of knowledge production and utilisation can be identified

Claims have been made that Sustainability Science research should contribute to a broader understanding of how to solve complex sustainability problems in that it must “prioritise problem-solving while critically questioning conditions that created problems of un-sustainability in the first place” (Jerneck et al. 2011:78). This is a reflexive approach for “breaking out of a particular reference frame in order to reap the benefit of seeing beyond its boundaries” (ibid:79). However, it should be noted that reflexive methodological pluralism of transdisciplinarity was not necessarily the original methodological perspective of Sustainability Science, nor is it now universally asserted. The next section will offer an account of the development Sustainability Science, noting the place of Scientific Realism and methodological pluralism within discussions. It is explained how responses to critiques and challenges have led many to claim that Sustainability Science encourages a transdisciplinary approach to research design.

4.2.2 Problem-based Approach: A Sustainability Science Perspective

The origin of Sustainability Science as a term to describe a particular approach to sustainability research first emerged in 1999. “Our Common Journey: A Transition Toward Sustainability” has been recognised as the first explicit call for the development of a “Sustainability Science” (Miller, 2013:280). This report was the product of a concerted and collaborative effort of 25 members of the National Science Academy’s Board of SD to both “address the research needs of the global commons of atmosphere, wind and water” and “reinvigorate the role of science and technology and Sustainable Development” and sustainable transitions (National Research Council, 1999: xiv). It called through three priority tasks for “advancing the research agenda” of Sustainability Science:

- i) “development of a research framework that integrates global and local perspectives to shape a “place-based” understanding of the interactions between environment and society”

- ii) “Initiate focused research programs on a small set of understudied questions that are deeper understandings of interactions between society and the environment”
- iii) “Promote better utilisation of existing tools and processes for linking knowledge to action in pursuit of transition to sustainability” (p10-11).

The report concluded that achieving these tasks required “creating new and strengthening existing ‘knowledge action: collaborations’ that bring together the many diverse and sector-specific groups that have the knowledge, and know-how and means” to implement sustainable transitions (p12). This conclusion stemmed from the identification of a lack of strategy in “applying what is known” and the “capacity to produce new knowledge” (p18) for SD. From this perspective it could be suggested that Sustainability Science emerged as a response to a perceived methodological failing in more disciplinary science to contribute to SD.

Further promoting this idea, in a foundational paper written by many of the contributors to Our Common Journey, Sustainability Science was seen as offering a space for “wide discussions within the scientific community regarding key questions, appropriate methodologies and institutional needs” and the opportunity to connect science to the “political agenda” of SD (Kates et al. 2001:642). To achieve these goals it was recognised that science would have to question its own ideologies and move beyond single disciplinary research (ibid). It could be said that Sustainability Science was founded upon the idea that “disciplinary science... had limited the capacity of science to address the problems that span multiple disciplines” (Perrings, 2007:15179) and in doing so, limited the ability of science to contribute to SD.

This goal of contributing to sustainable transitions, has underpinned the idea that Sustainability Science must fundamentally aim to be an applied science (Ostrom et al. 2007). This has not only reinforced the necessity of interdisciplinarity, but has also encouraged the use of societal contributions in shaping the research agenda. A number of practical reasons can be identified in the literature for the inclusion of non-academic knowledge in Sustainability Science projects.

Firstly, it is suggested that this type of research can overcome some of the complexity of understanding problems which transcend global environmental and social systems by enhancing access to data sets and identifying solutions (Komiyama and Takeuchi, 2006). Secondly with their practical knowledge, it has been argued that non-academic actors can prove essential in achieving the Sustainability Science goal of “knowledge to actions” (Cash et al. 2003:8088); not least because it is thought that knowledge that is coproduced will be more readily accepted by the non-academic community (Bäckstrand, 2003; Miller, 2013). Miller et al. (2014:240) argue that political and societal actors should be included in Sustainability Science research projects because “a combination of social values, political contexts, technological innovations and diffusion and obduracy of infrastructure and economic and institutional structures” can affect solutions.

Beyond these practical considerations there are also underlying value justifications for the use of non-academic voices in shaping research. Quental et al. (2011) claim that research priorities in Sustainability Science aim to be societal goals and maintain that sustainability research in general has developed from a “concern with the human impacts and availability of natural resources to a more balanced position that puts human and social capital at the centre of sustainability goals” (p273). They suggest that this is highlighted through the importance of what they term “means and ends sustainability” which focuses on the process of achieving sustainability knowledge. Goeminne (2011:632) argues that as sustainability research focuses on matters of “social concern” it is important that an emphasis is placed on the topical truth: in other words that the questions are socially relevant given the issues at stake. Clark and Dickson (2003: 8059) also suggest that high priority goals should not be chosen by academia alone but should be identified through “dialogue between scientists and people engaged in practice”.

Within Sustainability Science scholarship the purpose of research has arguably always been more explicitly normative than within traditional sciences. Kates et al. (2001:642) acknowledge that questions regarding appropriate methodologies are still open, and that “research itself must be focused on the character of nature-society interactions, and on our ability to guide those interactions along sustainable trajectories”. However, a reflection, perhaps, of its initial focus on science and technology studies, a number of

early studies made attempt to provide more certainty through structure to Sustainability Science by providing framings for appropriate research topics. In early papers using the term Sustainability Science, Kates et al. (2001) offer core questions for researchers; Cash et al. (2003) identify “knowledge systems for sustainable development”; Kates and Parris (2003) identify and clarify indicators for sustainable development and “long term trends for sustainability”; and Kajikawa (2008) identifies domains³ for Sustainability Science research. Within these frameworks there is very little acknowledgment of the contestation of the term sustainability, a potential limitation of Sustainability Science.

Miller (2013) categorizes this uncritical sustainability as “thin” or “universalist sustainability”. He suggests that by treating ecological sustainability as an undisputed concept, scientists are able to avoid opening up an arena in which the role of science and knowledge produced by scientists may be contested along with other concepts of sustainability. This failure to address its own constructions, has brought critique on Sustainability Science. It has been noted that there has been a lack of due attention given to the values inherent within sustainability (Splash, 2012; Baumgartner, 2011). This can have a significant impact upon how the research agenda develops and it has been found that Sustainability Science is influencing the landscape of sustainability research (Kajikawa et al. 2014).

For example, Goemmine (2011:631) argues that sustainability research still focuses predominantly on “global issues” to shape our science, reinforcing the idea of homogeneity associated with traditional “normal” science. Certainly whilst Sustainability Science research claims to be concerned with the relationship between local and global concerns (Kates et al. 2001) it does often take as its central premise the globalised nature of environmental change (Kates and Parris, 2003). Similarly there has been a tendency for researchers to focus on the most urgent of sustainable development problems (one of the most cited articles in Sustainability Science is Rockstrom et al.

³ A comprehensive list of potential areas for research including: climate; biodiversity; agriculture; fishery; forestry; energy and resources; water; economic development; health; and lifestyle (Kajikawa, 2008) but notably not specifically waste.

(2009); a discussion of the global environmental limits of the Earth's capacity) and yet little critical thought is often given to the construction of these crises.

On the other hand, Spangenberg (2011: 278) suggests that this “universalist” approach represents just one type of Sustainability Science, that which he entitles “Science *for* Sustainability”. This type of research, he suggests, is “problem-solving” and “seeks to find answers to problems within a particular perspective” (ibid). It could be seen as the Sustainability Science manifestation of Scientific Realism. Spangenberg contrasts this with “Science *of* Sustainability” where he says particular attention is paid to the definition of sustainability. This type of Sustainability Science is a reflexive practice which constitutes critical research. Spangenberg argues that Sustainability Science research can fall within either camp. This thesis takes a “Science *of* Sustainability” approach.

More recent efforts to “structure the research field” (Jerneck et al. 2011:72) have made some attempt to consider the critical constructions of SD within Sustainability Science and focus more on required research for enhancing understanding of Sustainability Science rather than just sustainability (Miller et al. 2014). Nevertheless, some of these constructions appear to adopt Scientific Realist approaches which suggests that a number of Sustainability Scientists apparently still subscribe to the philosophical belief that truth can be uncovered within the right framework. This is perhaps most notably observed in the work of Kumazawa et al. (2009:115) who attempt to uncover a dominant understanding by creating an “ontology based mapping tool”. They recognise that various actors contribute to knowledge within Sustainability Science and look to create a formalised structure - in a process they call “ontological engineering”- to find an understanding of the world that can be shared amongst Sustainability Science to progress the discipline.

Jerneck et al. (2011) produce a slightly more pluralist framing in their “three dimensional matrix” which identifies “core themes of Sustainability Science (scientific understanding, sustainability goals, sustainability pathways); cross-cutting critical and problem-solving approaches” combined with any chosen sustainability problem (p69). Their framework attempts to bridge between social and natural sciences, as they note that the latter has dominated Sustainability Science research. For Jerneck et al.

(2011:78) “differences in ontology and epistemology” are one of the main barriers to the integration of knowledge in Sustainability Science and they suggest that the problem-solving and critical “camps of Academia” must learn to cooperate.

However, this cooperation must come from researchers themselves and the balance between problem-solving and critical approaches is not easy to achieve. In his critique of the use of ontological arguments in the field of ecological economics, Splash (2012:41) notes that methodological pluralists face a difficult dilemma where “they must indiscriminately accept everything” or “accept some grounds for rejecting ideas and approaches”. He claims that this becomes particularly problematic in environmental research where there is an implicit value that there is some reality of a world without humans. He suggests that sustainability researchers “are trying to steer a course between the post-modern temptation to be nihilistic whilst avoiding the modernist temptation to claim a single optimal answer, a truth” (p43). He argues that to manage this, researchers must be open about “fact-value relationships” (p44). The same could be said of Sustainability Science.

There is some indication that this reflexivity between fact and values is not occurring in Sustainability Science. Recent research has suggested that Sustainability Science is having impacts on shaping sustainability research (Kajikawa et al. 2014) with a notable increase in the focus on environmental systems in the research. Calls have been made for more time to be spent mapping values inherent in Sustainability Science research (Miller et al. 2014). Others have suggested that Sustainability Science has not embraced pluralistic methodologies as much as could be expected from its rhetoric (Schoolman et al. 2012; Kastenhöffer et al. 2011). Miller (2013) notes that some researchers have sought to overcome this problem of acknowledging value within Sustainability Science by adopting a procedural approach to research in which the context is defined by the multiple stakeholders in the process. Reflecting this, the recent trend in Sustainability Science methodology research is to offer process guidance rather than attempting to define the research field. Many of these approaches advocate the use of transdisciplinarity (i.e. Brandt et al. 2013; Lang et al. 2012).

This methodological guidance centres on coherency of problem-framing; transparency of methods for problem-solving; integration and application of reframed knowledge for

sustainability (i.e. Brandt et al. 2013; Lang et al. 2012). As a consequence much of the work of Sustainability Science is facilitating the communication to create a common understanding of concepts and framings and, therefore, problems and solutions of sustainability issues. As a consequence, Lang et al. (2012:27) describe Sustainability Science as an “interface practice”. This framing suggests that in order to understand Sustainability Science, it is necessary to consider how this transdisciplinarity manifests in practice.

4.2.3 Transdisciplinarity in Practice: Sustainability Science in this Thesis

Although transdisciplinarity can be presented as somewhat of a panacea to Sustainability Science’s methodological challenges, the term itself is contested both within and outside Sustainability Science literature. On the other hand, in comparison to Sustainability Science, there has been some suggestion that a more coherent picture of what constitutes good transdisciplinary research has begun to emerge (Wiesmann et al. 2008). Mobjörk (2010:868) suggests that there has been at least “a development of a common language” and Jahn et al. (2012) have made some attempt to build a model of transdisciplinarity based on a literature review of the topic.

Transdisciplinarity has no agreed definition but in this thesis the term is taken to mean:

“a reflexive, integrative, method-drive scientific principle aiming at the solution or transition of societal problems and concurrently of related scientific problems by differentiating and integrating knowledge from various and societal bodies of knowledge.” (Lang et al. 2012:26-27)

Wiesmann et al. (2008) argue that transdisciplinarity involves the production of three types of knowledge; systems knowledge, target knowledge and transformational knowledge which, adapting Max-Neef’s (2005) classification might be best understood as ‘what exists?’ ‘what do we want to achieve?’ and ‘how can we get there?’. This tripartite approach is reflected in the framework for “The Ideal Type of Transdisciplinary Research” (Lang et al. 2012) which has been used to shape the research strategy in this thesis (see Section 4.3.1 p117).

It has been noted that there is very limited direction in how to overcome philosophical challenges in transdisciplinary science (Patterson et al. 2013). Instead it could be said that guidance in transdisciplinarity tends to focus on the practical aspects of the research. This is, perhaps, understandable; it has been widely noted that practical difficulties often thwart transdisciplinary type research: challenges have been acknowledged in the integration of knowledge, evaluation and participation (Wiesmann et al. 2008; Jahn et al. 2012). Brandt et al. (2013) note that whilst many aim to undertake transdisciplinary research, in practice far fewer achieve this goal. It has also been suggested that the application of participatory methods is quite low (Kastenhofer et al. 2011) and that research has failed to make “real world impacts” (Wiek et al. 2012b:22).

Some have taken these challenges as an opportunity to call for more methodological fortitude within transdisciplinarity (i.e. Turnpenny et al. 2011; Wiek et al. 2012a). Others have adopted a more flexible approach to transdisciplinary requirements. Stock and Burton (2011) contest the idea that transdisciplinarity involves implementation of results, and also question the requirement to involve stakeholders at every stage of the research process. Although they state that participation is an important feature of transdisciplinary research, they argue that what truly differentiates transdisciplinarity from interdisciplinarity is that the former “extends the research beyond simply problem-solving towards synthesising new bodies of knowledge with which to address complex system problems” (p102).

Mobjörk (2010) takes a similar perspective and suggests that the realities of conducting research with multiple stakeholders have resulted in the emergence of two distinct forms of transdisciplinarity: ‘consulting’ and ‘participatory’. Whilst the latter might more closely follow the research design most widely promoted in transdisciplinarity literature, the former is also widely used where there are limitations to the ability to engage with non-academic participants. Mobjörk (2010:871) suggests that *consulting* transdisciplinarity does not actively involve the stakeholders in the “knowledge production process” by which it is meant that participants do not necessarily engage in an open dialogue, although their views are taken account of by the researcher.

Calls have been made for epistemological pluralism in which transdisciplinarity does not always require “engagement” (Miller et al. 2008:48). Miller et al. (2008) suggest that this approach involves adopting a way of knowing specific to the topic in question. They admit that this requires active reflexivity on researcher values and aims and argue for research which encompasses “a reorganisation of multiple, potentially equally valid ways of knowing” but recognise that this “requires a negotiation governed by the specifics of the question and the composition of the research team” (p57). As a consequence they describe this epistemological process as an adaptive cycle to be reflected on throughout the research process.

Pohl et al. (2008:414) suggest that “the core task of transdisciplinary research is to integrate the diverse scientific and societal views of the problem recursively” which involves using knowledge from relevant stakeholders both within and outwith academia. Building on the “problem-specific integration of knowledge and methods” Jahn et al. (2012:2) state that transdisciplinary finds its research questions “at the interface of scientific questions and societal problems”. This type of integrative practice, it has been argued, requires some specific approaches from transdisciplinary researchers: with a particular emphasis placed upon the reflexivity within the research process (Wiesmann et al. 2008). This thesis takes the position that although *participatory* transdisciplinarity can enhance this process, it is not a prerequisite and it is through transparent reflection on the constructions, limits and boundaries of multiple sources of knowledge within a project, that research can claim to assume the spirit of transdisciplinarity.

This thesis uses *consulting* transdisciplinarity which means that although insight from non-academic actors was sought and used to develop the research strategy, the actors were not involved in designing the data collection or interpreting the data. Although the limited capacity of an individual researcher played a role in shaping this design, many of the strategic choices in this thesis were made as a reflection of the requirements of studying waste in Scotland. Sustainability Science aims to be problem-driven rather than discipline defined and as a consequence it seems sensible to allow flexibility where the sustainability problem requires it. Moreover, if Sustainability Science research aims to understand complex realities, it must also openly recognise the complexity within the research process and react accordingly.

This research project was focused on ZW at the policy level. As a consequence, the interviewees, who were either specialists or held high level policy roles, could be considered “elites” (Vaughan, 2011:107). Debate remains as to whether engaging with elites presents specific challenges (ibid), however, in this project it was found that the interviewees’ “elite” position did have consequences for conducting more participatory research. It has been particularly noted that interviews with elites take a lot of time and persistence (Aberbach and Rockman, 2002), and that it can be difficult to gain more than “one bite at the cherry” with elite interviewees (Vaughan, 2011:11; Lilleker, 2003). Moreover, research has suggested that on the limited occasions where participatory research results in “real-world impacts” these tend to be small “case-based solutions of applied science” (Wiek et al. 2012b:22). As a consequence *participatory* transdisciplinarity was deemed inappropriate for research at this scale.

In addition, at an early stage in the research, it became apparent that for many of the interview participants, the PhD label was problematic. Lang et al. (2012) acknowledge that issues can arise in transdisciplinary research stemming from a lack of problem awareness, unbalanced problem ownership and insufficient legitimacy of the particular team members. In earlier chapters in this thesis it was explained that there has been very little interaction between academia and Scottish waste governance and as a consequence, each of these limitations were identified in this project.

The PhD student label and a corresponding lack of legitimacy, was perceived to be a major barrier to encouraging participation. A number of the interviewees referred to the PhD as a course and others saw it as an ‘academic’ exercise. There appeared to be a lack of openness from some to the idea that a PhD could produce knowledge of direct practical value or that the research was for a purpose beyond an academic qualification. Elzinga (2008:356) has suggested that scientific illiteracy has been a noted barrier to participation, and in this case it was felt that insufficient understanding of PhD process prevented participants from seeing the potential benefit of the research to their own roles. In existing transdisciplinary literature questions of legitimacy focus heavily on research process, thus suggesting that these barriers can be systematically overturned (Wiesmann et al. 2008). Less has been made of institutionalised conceptions of legitimacy and how these may contribute to a research strategy, and yet, Miller and

Glassner (2011:134) note that “the issue of how interviewees respond to use based on who we are... is a practical concern as well as an epistemological or theoretical one”.

Although various commentators have noted the difficulties that face PhD researchers in conducting Sustainability Science research (i.e. Hacket and Rhotten, 2009; Felt et al. 2013; Wiek et al. 2012b), no comprehensive guidance specific to creating a research strategy for a Sustainability Science PhD could be found. As a consequence, an early decision was made to use *consulting* transdisciplinary. The research strategy in this project was also based on the framework promoted by Lang et al. (2012) (adapted from Jahn et al. 2012) as the ‘ideal’ process for transdisciplinary sustainability research.

This process is split into 3 phases: Phase A “Framing the Problem”; Phase B “Coproducting Solution-Oriented and Transferrable Knowledge” and Phase C “Integrating and Applying the Produced Knowledge in both Scientific and Societal Practice” (See Box 4.1 p117). This framework offers ambitious criteria for transdisciplinary research, but its authors do acknowledge that there will be different levels of stakeholder involvement at different points in the process (Lang et al. 2012). Although this thesis contends that to engage in the level of transdisciplinarity and co-production of knowledge envisaged by Lang et al. (2012) is beyond the scope of a PhD project, it recognises that their approach can be used as a transparent account of how the research used different sources of knowledge. The next section offers a narrative of the research process including data collection, data analysis and the research strategy.

4.3 Research Strategy and Methods

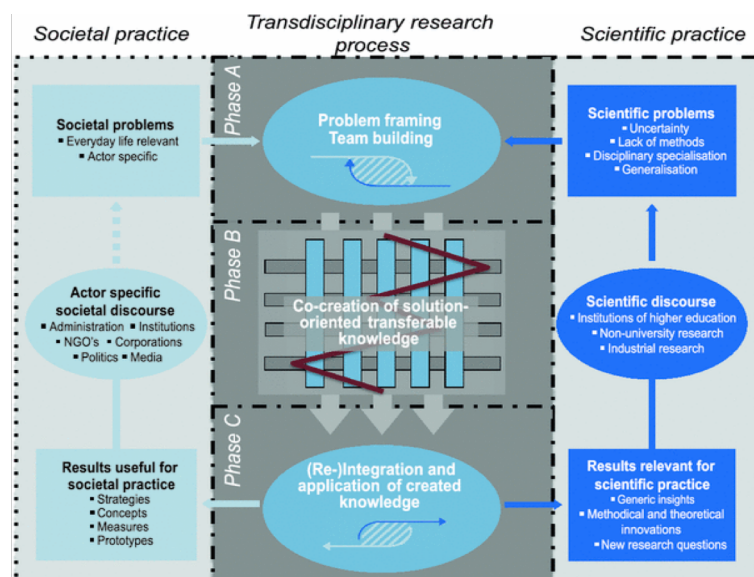
This section begins with an account of how Lang et al.’s (2012) process was used and interpreted in this thesis. Although the three phases are discussed separately, the process was found to be more fluid, with each phase both emerging from and reshaping interpretations from the previous phase. Initially the research strategy was to collect new data at each phase of the project, but again, reflecting the fluidity of the process, it was found that data was rarely used exclusively within one phase. The data analysis also occurred throughout the process. The latter part of the section offers further explanation of how the data was collected and analysed.

4.3.1 Research Design

Lang et al. (2012:40) note that there is “no recipe” for transdisciplinarity in Sustainability Science; however, their framing of the transdisciplinary research process (See Box 4.1 p117) was found to be useful in shaping the research strategy in this project. This framework was based on the work of Jahn et al. (2012) who sought to clarify the research approach that predominates within transdisciplinary research. Lang et al. (2012) specifically tailored the process for sustainability research that aims to be transformational.

In their framing Lang et al. (2012) promote the use of research teams with both academic and societal stakeholders and their framing envisages a very participatory process. Research has shown that this level of participation is rarely applied in practice (Kastenhöffer et al. 2011). The original transdisciplinary process described by Jahn et al. (2012) calls far less for such an integrated co-production process of knowledge. As a consequence, although the research strategy was constructed using Lang et al.’s (2012) terminology and descriptors for each stage of the research process; their framework has been interpreted more as guidelines than definitive rules.

Box 4.1 The Ideal Transdisciplinary Research Process



(Lang et al. 2012)

Phase A: Framing the Problem

Jahn et al. (2012:5) suggest that the first stage of a transdisciplinary project is where “societal and scientific problems are linked to form a common research objective”. For Lang et al. (2012:29-32) this involves building a collaborative research team, creating a joint understanding of the sustainability problem, defining the research boundaries, identifying research questions and creating a methodological framework for knowledge “production and integration”. In this research project Phase A as problem framing involved: constructing and conducting a literature review of relevant studies (waste; waste governance and ZW); developing the researcher’s understanding of the waste governance in Scotland; creating and confirming the salience of the research question; and establishing the preliminary suitability of governmentality as a framework of analysis.

The lack of coherency in waste literature was seen a challenge, however, the review was guided initially by the paradigm filter of sustainability and so used the problem-focused and solution-oriented aspects of Sustainability Science to focus attention upon the problematisations of waste in society and ZW as a solution to this problem. Having conducted an initial academic literature review, further information was sought on waste policy as discussed in Scotland.

Observations from the field and a review of grey literature on waste and ZW in Scotland supported the view that waste was seen as a governance issue. This then refocused the literature review on studies of waste governance. At this stage, as well as identifying areas for further research from the literature, attention was paid to the ways in which academic researchers had tried to make sense of waste and other complex governance issues. The concept of governmentality was identified as offering potential and alongside findings from the initial peer-reviewed literature allowed the construction of a basic framework for scoping interviews.

These scoping interviews were initially chosen as a method to further develop societally appropriate research questions. However, it became apparent early on that this approach was ineffective and unnecessary. The issues experienced in data collection are discussed

in Section 4.3.2 (p123) of this thesis. The early scoping interviews confirmed that not only was there a lack of academic knowledge of governance of ZW in Scotland but that stakeholders also identified ambiguities within the ZW policy in practice, particularly in relation to links between the policy's objectives and interventions. From both the academic literature and initial interviews, it became apparent that one problem surrounding ZW is the lack of clarity of the definition of the term, how this relates to policy objectives and how these policy objectives are being pursued. As a consequence, it was decided that the first aim of the thesis should be: *to develop an understanding of ZW governance in Scotland*. To achieve this aim, two research questions were identified which spoke particularly to gaps in ZW literature and uncertainties described by the interviewees.

- 1) How is the policy goal of ZW *understood* in Scotland?
- 2) How is the policy goal of ZW *pursued* in Scotland?

It was found that data from the scoping interviews provided sufficient insight into these questions from individual interviewees, and so the decision was made to interview more participants using the same semi-structured interview format used for the scoping interviews. Interview data was further supplemented with documentary data. Again the collection processes for each data set is further explained in Section 4.3.2 (p123) of this thesis. This data was both analysed within and used to construct the Framework for Analysis used in Phase B of the research strategy.

Phase B: Investigating the problem and identifying solutions

For Lang et al. (2012:32) this phase involves apply[ing] and adjust[ing] integrative research methods and transdisciplinary settings for knowledge generation and integration". Jahn et al. (2012:6) put this more simply as "categorization of new knowledge". Lang et al. (2012) suggest that this phase should contribute to both societal and academic discourses and it is arguable that governmentality offers a useful framework through which to achieve this goal. Ettinger (2011: 538) describes governmentality as offering "an analytical framework that is especially useful towards connecting abstract societal discourses with everyday material practices".

Lang et al. (2012:32) state that this phase involves prescribing “appropriate roles for practitioners and researchers”. Governmentality requires evaluation of techniques and practices within a given policy arena. Arguably it would be both practically and politically difficult for individuals engaged in those regimes to critically consider the actions, choices and policy implementations of their colleagues in an open discussion. As a consequence the type of co-production process that Lang et al. (2012) envisage would be inappropriate for this policy arena. Marsden (2011:310) notes that Sustainability science needs to find “innovated ways of combining stakeholders and experts at different governance scales”. This thesis use two approaches to achieve the “solution-oriented” and “socially robust knowledge” that Lang et al. (2012: 27) suggest should emerge from this phase.

Firstly knowledge from non-academic actors was drawn from to shape the Framework for Analysis and secondly this Framework for Analysis was used in a process which allowed for the input from a plurality of knowledge sources. This focus on both empirical and academic contexts resulted in the second aim of this thesis: *to critically assess the governmentality of the ZW policy in Scotland in relation to sustainable development*

The aim was underpinned by two research questions which drove the development of the governmentality framework.

- 1) What is the rationale behind the implementation of ZW policy in Scotland?
- 2) How does the rationale of ZW governance compare with governmentality for sustainable development?

Although individual interviewees did not participate directly in creating the Framework of Analysis used in this phase of the research, their contributions did shape the Framework for the latter stages of analysis. This process is further explained in Section 4.3.3 of this thesis (p123). The findings from the analysis were considered against the existing environmental governmentality literature in the structure outlined in Section 3.3 of this thesis (p72). This structure was created to allow links to be made to existing literature (Ecogovernmentalities) creation of problem specific knowledge (Environmentalities) and consideration of future steps for a transition to more

sustainable practices (Governmentality for SD) and, therefore, satisfying the goal of Sustainability Science to aim to contribute to knowledge for sustainable transitions and so provide academically interesting but societally relevant results. For Lang et al. (2012) the final stage in the transdisciplinary process is evaluation of these results.

Phase C: Evaluation

Phase C involves “integrating and applying the produced knowledge in both scientific and societal practice” (Lang et al. 2012:27). It is suggested that this should include generating “targeted products” for both societal and academic actors and should include an evaluation of societal and scientific impact (p34). Stock and Burton (2011:1009) question the necessity of implementation as a required outcome because projects can be “practice or theory based”. As a PhD thesis, this project predominantly fits within the latter category, so although a ‘target product’ has been created to be disseminated to all interviewees in the form of a Summary of the PhD Findings (Appendix 6), the main output of this project is the thesis itself. As a consequence, this phase was constructed as an evaluation of the thesis findings and structure and so the third aim of the project became: *to investigate governmentality as an analytical framing through which to understand the governance of ZW in Scotland.*

It is noted that for boundary work between science and practice, questions must be asked of the “salience, legitimacy and credibility” of the research (i.e Cash et al. 2003; Miller, 2013). Although these criteria are usually used in reference to specific boundary organisations involved directly in policy, there was little guidance available in the literature on what might constitute good research for a Sustainability Science PhD and so Phase C was designed with these categories in mind.

Credibility is a recognised quality for qualitative and quantitative science. Jensen (2008:139) states that “the basic notion with credibility is that both the readers and participants must be able to look at the research design and have it make sense to them”. In qualitative social science, the validity of the research is gained by asking whether the research strategy is transparent, reflexive, supported by multiple sources and in line with existing understandings of the topic (Saumure and Given, 2008:795). For Sustainability Science, this might be more accurately interpreted as asking whether the research actively include perspectives from a sensible number and variety of

stakeholders in the issue and whether the findings speak to both academic and non-academic communities.

In some ways this is also captured by the concept of legitimacy. For Cash et al. (2003: 8090) legitimacy is “the perception that the production of information and technology has been respectful of stakeholders' divergent values and beliefs, unbiased in its conduct, and fair in its treatment of opposing views and interests”. It could be argued that transparency in how the data has been used and interpreted as key to achieving trust in qualitative research (Saumure and Given, 2008) is also an essential component of legitimacy. In Sustainability Science this goes beyond explaining how the data has been used in line with disciplinary boundaries, to elaborating on researcher reflections about the values contained within the research decisions. The importance of identification of values is central to this type of research (Wiesmann et al. 2008; Wiek et al. 2011)

Finally, salience is more specific to the goals of Sustainability Science to actively contribute knowledge which encourages sustainable transitions. It considers “the relevance of the assessment to the needs of decision makers” (Cash et al. 2003:8090). This speaks to the need of Sustainability Science to pursue research questions which are both scientifically and societally relevant. Cash et al. (ibid) state that legitimacy and salience are “tightly coupled” and that “efforts to enhance one normally incur a cost to the other”.

To evaluate the thesis, each of the criteria was applied to the research findings. The credibility was evaluated by asking whether the research made sense in light of existing literature in this area. Within the interview process, participants were asked to identify areas in ZW policy that they thought required further research, this data was used to consider whether the findings could contribute to societal questions of ZW. A similar process was conducted looking at the limitations of existing research in ZW. These discussions shed light on the salience of the project. Finally, legitimacy of the project was evaluated with consideration given to the choices of data collection, analysis and application of theory. The following sections offer further information about how data was collected and analysed.

4.3.2 Data Collection

Research guides suggest that researchers must take into account the methodological consistency of both their selection and application of research method and ensure that the ethical questions raised by these choices are reflected upon (i.e. Silverman, 2011). Miller (2015) argues that for Sustainability Science to contribute to sustainable transitions, these choices must be ‘contextual’, ‘plural’, ‘robust’ and ‘reflexive’. The data collection methods in this thesis were chosen because they were contextually appropriate to understand waste in Scotland and presented a plurality of accounts of ZW governance. Data was collected in stages and from multiple sources, allowing the Framework of Analysis to be shaped in accordance with societal perceptions of the problem and ensuring that the findings were socially as well as academically robust. Finally specific attention was paid to the potential implications of the research on social, cultural and political processes, which Miller (2015) claims are inevitable consequences of sustainability research. Two primary means of data collection were used in this thesis: semi-structured interviews and document analysis.

Interview Data

The research began with semi-structured interviews which were conducted between November 2012 and July 2013. It has been claimed that we are living in an “interview society” (Roulston, 2010: Introduction) where interviews become almost synonymous with qualitative research (Silverman, 2011). Methods guides suggest that despite its ubiquity and practical appeal, researchers must still reflectively justify both the choice and use of interviews as a data collection method (Roulston, 2010; Silverman, 2011).

Interviews were chosen as the initial method of data collection for three reasons. Firstly there is very little “naturally occurring data” (Silverman, 2011:165) on waste, or ZW in Scotland beyond policy documents. The interviews were used to produce a broader account of waste governance in Scotland. Secondly, research has suggested that studies which more accurately reflect the complexity of multiple governmentalities must go beyond official documents, to engage with accounts of those working within the policy (McKee, 2009). Finally, interviews were chosen for their flexibility: it was more straightforward to arrange meetings with individual experts than to coordinate

participant schedules to arrange focus groups and so this gave access to a broader range of stakeholders.

30 semi-structured interviews which lasted between 25 and 90 minutes were conducted with members from the across the policy-making spectrum (see Box 4.2 p124). The interviewees were all waste specialists or played central policy roles, as a consequence, they could be considered “elites” (Vaughan, 2011). One PhD supervisor (as a member of the ZW Think Tank) acted as a gatekeeper to access other members of the Think Tank. These initial scoping interviews were supplemented predominantly by using snowball sampling. Snowballing can be subject to criticism: with some suggestion that it can limit data collection to similar and supporting views (Bryman, 2004) and so some additional interviews were conducted with other actors in the policy arena, identified by the researcher. The 30 interviews appeared represent every major stakeholder group in the sector (see Box 4.2 p124).

Moreover the waste policy community in Scotland is small and movement of individuals between roles is common. Many interviewees offered views based on their experience working in public, private and civil society organisations. Similarly some interviewees were directly engaged with policy creation as well as implementation.

Box 4.2: Interviewee Representations			
1	Enterprise Agency ★	16	Third Sector
2	Independent Consultant ★	17	Third Sector
3	Local Authority ★	18	Environment Agency
4	Environment Agency ★	19	Government ★
5	Independent Consultant *	20	ZW Scotland
6	Academic ★	21	Independent Consultant
7	Academic ★	22	ZW Scotland
8	Academic *	23	Environment Agency
9	Media	24	Independent Consultant*
10	Enterprise Agency	25	ZW Scotland
11	Legal Expert	26	Government
12	Industry Representative	27	Third Sector
13	Independent Consultant	28	Legal Expert
14	Industry Representative	29	Local Authority
15	Independent Consultant * ★	30	Industry Representative
* indicates participation in government funded waste agency prior to creation of ZW Scotland			
★ indicates participation in the ZW Think Tank			

The interviews varied in length, dynamic and practical matters⁴ which are noted issues with “elite interviews” (Marshall and Rossman, 2006:105). The structure was loosely based on the elements of the governmentality framework (Appendix 2 p258), however, in an effort to ensure that the participants “perspective on the phenomenon of interest” was uncovered rather than the thesis research agenda, space was left for conversation and general discussion (Marshall and Rossman, 2006:101). This, coupled with time constraints, meant that not all questions were asked of all interviewees. This was not considered a restrictive limitation to the method; the primary reason for interviewing was to gain an understanding of the policy arena as a whole rather than to consider individual’s perceptions of ZW in Scotland and, as a consequence, any missing perspectives could be garnered using additional research methods.

Interviewees were informed in advance of the general topics for discussion and were asked to consent to the collection of data (See Appendix 1). This was an attempt to keep the interviews as transparent as possible. Although it has been suggested that elite interviewing techniques are often couched in terms of obtaining truth, overcoming the dishonesty of the respondents and assisting the powerless researcher (Morris, 2009), this project took the perspective that interviewees would answer the questions truthfully from their own perspective. This links to Morris’ (2009) argument that elite interviews can be enhanced by reflecting on ontological and epistemological philosophies that underpin the research. If Sustainability Science is about valuing contributions to knowledge, it is necessary to take the perspective that no informed participant holds a better perspective on a topic than another. For similar reasons the interviews were not subject to detailed discourse analysis.

Although it was recognised that transcription is the most common form of recording data in social science, interviews in this project were not transcribed. As recording and transcribing interview data is widely practiced in qualitative science, it has been suggested that their benefits are often “taken for granted” (Poland, 2008:885), however, literature suggests that transcription provide benefits to the social researcher both in

⁴ Interviews were conducted by Skype, telephone and in person (both in private offices and public spaces). The decision where and when to conduct the interview was left to the individual participant in recognition that their busy schedules would leave little room for flexibility.

analysing and presenting the data. Silverman (2011) notes that transcription allows the researcher to return to develop the text of interviews, returning to the conversation and enhancing the notes. He also notes that transcription provides a validation of the research by offering a publically available account of interviews. Enhancement of the validity of the research through the use of illustrative quotes from interviews has also been noted as a benefit of direct transcription (Royston, 2010). In addition to providing validity to the findings, the use of quotes is seen to provide richness to the research narrative by allowing the interviewees' voices to be heard within research (Boylorn, 2008).

Despite these benefits, on reflection this research project used researcher notes to record the data. This was for three reasons. Firstly a number of interviewees declined to be recorded and so notes had to be taken during the interview and written up immediately after. It is arguably more consistent to maintain the same approach for those that were recorded. Secondly as the interviewees were not being subjected to discourse analysis it seemed an unnecessary and time consuming step for little purpose. Robson (2011) notes that contrary to popular belief not all research requires to be transcribed. He notes that thematic analyses rarely require that level of data detail. Finally, and perhaps most importantly, interviewees were made aware that where recordings or notes were used, these were for researcher aide memoires only this was to make the interviewee feel more comfortable. Both from previous experience as an interviewee and from reactions from this project's participants (including those who declined to be recorded) analysis of verbatim data can make many participants feel uncomfortable. Bryman (2004) suggests this is commonly experienced challenge in qualitative interviews. Holstein and Gubrium (2011:159) argue that instead of adopting strict practices of how an interview should be undertaken, researchers should endeavour "to provide an environment conducive to the production of the range and complexity of narratives that might develop".

Although no interviews were transcribed, some were recorded with the participant's permission. This choice was based on practical necessity; the interviews were conducted in a number of geographic locations and it seemed sensible, where, possible to conduct a number of interviews in the same location on the same day. This limited the possibility of writing up the interview immediately afterwards.

The decision not to use direct transcripts also helped keep the data anonymous. It was recognised that the small community and highly political nature of waste within Scotland meant that participants might be willing to both participate in the research project and to be more honest in expressing their beliefs if their views were anonymous. Although not necessarily a personal subject, it has been recognised that those working within policy may be more likely to speak openly “off the record” (Lillekar, 2003). However, it also became apparent during initial interviews that participants were more open than first envisaged. Given the close-knit nature of the waste policy community in Scotland, it was thought that ethically, to prevent any unexpected political repercussions for individual participants from the research that anonymity of the interviewees would have to go beyond not naming participants. As a consequence this thesis does not quote directly from individual interviews. It is recognised that this decision prevents the emergence of interviewee voice from the data which may be considered to be a limitation for the communication of the research findings.

On the other hand, in many ways this interview approach in this thesis links to what Roulston (2010:Chapter 3) calls a “decolonising” interview style where the researcher reflects on the particular cultural practices of the location of study and critically evaluates the potential negative repercussions of the research on the location. Although her categorisation considers “western ways of knowing” and “indigenous people” this thesis found that it is worth extending this understanding to areas which have not traditionally had a link to critical social science, particularly if future research is to be conducted in that domain. Roulston states that in “decolonising” research there are “ethical matters of on-going concern for the researcher which are inextricably intertwined with the motivating force for the research itself” (ibid). Miller (2015) notes that the diversity and complexity of sustainability issues means that research can have unexpected consequences. He argues that researchers must be aware of this. These reflections played a key role in shaping the presentation of knowledge from interviews in this project.

Although effort was made to allow interviews to develop their own discussions on ZW, there is no escaping that researchers have a direct impact on shaping interview data (Silverman, 2011; Roulston, 2010). As a consequence, although interviews formed the

bulk of the initial data collection, a decision was made to also include policy documents as part of the analysis. It has been noted that documents can “provide rich, naturally occurring, accessible data which have real effects in the world” (Silverman, 2011:287). This is not to suggest that documents were more accurate representations of ZW, for documents are also constructed for a purpose (Prior, 2011) but rather it was taken that they represent another account of the ZW policy which was not shaped by the researcher.

Documentary Data

28 policy and policy-related documents were analysed (See Appendix 5 p278). These documents were chosen by three methods a) selecting the major policy documents in ZW over the period 1996 - 2013 b) identification of key documents by interviewees and c) researcher choice. The latter was based on knowledge and experience of the waste management area gained over three years of interaction with the sector.

Prior (2011:95) suggests that documents can be seen as a ‘resource’ and as a ‘topic’. In each approach, he suggests the document can be analysed for both content, and use and function. For a resource analysis this requires asking “what is in the document?” and “how is the document used as a resource by human actors?” (ibid) For a topic analysis consideration is given to how a document is created and how it impacts on societal organisation. In this research project this thesis primarily chooses to focus on analysing the documents as a resource.

This does not mean that it does not recognise that documents may be political, however, it has been noted that one of the greatest strengths of content analysis is that “it is unobtrusive and non-reactive” (Marshall and Rossman, 2006:108). Many of the interviewees created the documents analysed in this thesis and to critically assess their work through discourse analysis could be misinterpreted. It has been suggested that this approach to critical environmental research tends to identify “winners” and “losers” (Robbins, 2004:11) and this was not the intention of this thesis. Miller (2015: Chapter 6) notes that Sustainability Science is inherently “normative” and is interested in what we “ought” to be doing to promote sustainable transitions. There has been some suggestion research which promotes only critique of sustainability discourse does little to achieve this goal (Forsyth, 2003).

As a consequence this thesis adopts Atkinson and Coffey's (2011:79) point that whilst "documents are 'social facts'... they are not, transparent representations of organizational routines, decision-making processes or professional practices" and the documents were primarily considered in terms of "what is in the document" (Prior, 2011:95). Each document was analysed with the revised Framework of Analysis and attention was paid to both words and visual representations contained within the document. Nevertheless further analysis was undertaken in relation to understanding when the document was written, by whom, and how the document has been used in the practice of ZW Governance. In order to ascertain the latter, the relationships document-document and document-interviewees were noted (both in terms of authorship and reference in interviews).

Additional Data

In keeping with the 'decolonising' nature of the data collection which links closely to anthropological research, an attempt was made to understand key discussions and terms within the ZW regime in Scotland. As a consequence throughout the research process (including the literature review), 'field research' was also conducted. National Practitioners conferences (Scottish Waste and Resource Conference 2012 and 2013) and seminars and workshops hosted by ZW Scotland were attended. The four part online course "On Course for ZW" hosted by ZW to teach organisations about waste management was also completed. The researcher became a student member of the Chartered Institute of Waste Managers and received monthly publications on waste management in the UK. Finally two days were spent in court at the first legal case to consider the ZW Plan (North Lanarkshire Council v The Scottish Ministers and Shore Energy [2013] CSIH 58). The judgement from this case became a document for analysis.

The purpose of these observations was not to collect data for analysis (and so no detailed field notes were taken) but the information from these sources was used to compensate for the lack of literature on waste in Scotland by familiarising the researcher with the terms, organisations and groups involved in ZW in Scotland. The data that was subject to governmentality analysis was only the interview and document

data. The next sub-section of this chapter explains how that data was considered through a Framework for Analysis.

4.3.3 Data Analysis

This research project adopted a qualitative analysis of data collected. Silverman (2011:23) argues that there is no “agreed doctrine” of how to conduct qualitative analysis. Instead he notes that qualitative social science research has adopted a number of ‘isms’ through which “particular vocabularies, investigatory styles and ways of writing have emerged’ (ibid). Silverman suggests that researchers should avoid labelling analysis, a practice, he says, that is more about identifying “tags” to appeal to your research discipline than assisting in clarity (p59). This research project has not sought to align itself within a specific discipline and so does not lend itself to a particular dominant vocabulary or form of analysis. Moreover Greckhamer et al (2008: 22) suggest that to enhance interdisciplinary studies researchers should reflect on “their assumed grand narratives of doing, legitimizing, and governing the production of knowledge, universal structures and meaning”, this would suggest avoiding adopting a single ‘idiom’. As a consequence the account of the analysis in this project is offered as a narrative of research steps.

The data was analysed and coded in a two step process. Firstly interview data was analysed using a Framework for Analysis developed from grey and academic literature. These findings were then used to reshape the Framework of Analysis to consider the documentary data. The aim of this approach was to include contextualised systemic knowledge beyond that of the individual researcher and existing literature. There was a dual purpose to this process: firstly, this was an attempt to render the thesis more transdisciplinary in line with the methodological goals and secondly, it was used to fill some of the apparent gap in existing literature on the nature of waste governance in Scotland.

Other studies have used Dean’s (1999) Analytics of Government as the basis for their theoretical framings of governmentality; however, the researcher found that none of these studies (including Dean’s own approach) gave detailed guidance as to how empirical data had been analysed in relation to each component of Dean’s framing. As a

consequence, some time was spent creating a more detailed Framework of Analysis for this study. In line with Dean's (1999) approach, the framework separated analysis into 6 key elements: Identification of Problematisations; Fields of Visibility; Techniques of Government; Knowledge; Identities; Utopian Ideals. It should be noted that each element was not mutually exclusive and data was often coded under more than one heading.

The initial framework (Framework 1 – See Appendix 3 p260) was created to interpret data from the 30 expert interviews. This was purposefully designed to allow both deductive and inductive analysis within each element to reflect the methodological choices within this thesis. Codes within each of the 6 elements were chosen from existing literature and researcher knowledge of the field. The central ideas behind these codes were noted in a guide (see Appendix 3 p260). This was used as an aide-memoire throughout the analysis process. This analysis was done by hand.

The second framework for analysis (Framework 2 – See Appendix 4 p269) used the information from the 30 interviewees to revisit the coding within the 6 key elements. The purpose of this reshaping of Framework 1 was to reflect the Sustainability Science goals of this thesis in which multiple knowledges are used to construct the research project. A further research guide: was created to assist the researcher in this process (see Appendix 4 p269). This analysis was conducted using a combination of manual and digital coding using NVivo (2014) software.

The decision to use NVivo was initially based on the length of some of the policy documents. NVivo is cited as being “easier and quicker to code text” (Welsh, 2002). In this sense the software was chosen primarily for its ability to “manage data” rather than for interpretative purposes (Bazeley and Jackson, 2013:Chapter 1). The coding was constructed to mirror the Framework 2. This Framework was used to analyse the 3 national policy documents (*National Waste Action Plan* (2003); *Zero Waste Scotland Plan* (2010); *Safeguarding Scotland's Resources: Blueprint for a more resource efficient and circular economy* (2013)).

At this stage it became apparent that the coding was too detailed and was providing a complicated and inaccessible account of governmentality of ZW in Scotland. It has been

noted that NVivo software can expose over-coding (Bazeley and Jackson, 2013). It was decided that sufficient detail had been obtained to allow a rich picture of ZW governance in Scotland to emerge and the decision was made to take a more constricted approach to coding of the additional documents, using only the 6 elements of Dean's (1999) Analytics of Government. This coding was done by hand – although NVivo (2014) proved to be a more efficient way of coding, it was felt to offer less opportunity to understand the document as a whole (a recognised weakness of ICT analysis: Bazeley and Jackson, 2013; Roberts and Wilson, 2002). During this coding process attention was paid to any discrepancies with earlier findings. This approach also allowed the researcher to maintain perspective on the purpose and role of the documents, rather than becoming bogged down in the emergent themes found across the data. Silverman (2011) notes that researchers must be aware of specifics of data sources as well as broader themes.

It was found both in the documentary and interview data analysis, that the Frameworks for Analysis sometimes failed to capture key ideas or the broader message contained within individual sources. To ensure that these were not lost, a research diary was kept to document these ideas. This is a recognised approach to encourage reflexivity for both manual and digital coding (Marshall and Rossman, 2006; Bazeley and Jackson, 2013). This data was also used to reflect back on the usefulness of governmentality to understand ZW in Scotland and so contributed to the methodological aim of this thesis.

4.4 Research Aims and Contributions

This chapter has explained how a Sustainability Science approach has been used as the methodology in this thesis. It began by outlining the “philosophical ballasts” (Moses and Knutsen, 2012) that underpin that approach; explaining that Sustainability Science is an example of Methodological Pluralism which balances different ontological perspectives and uses a range of epistemologies. It was suggested that Sustainability Science often links to ideas of transdisciplinarity to balance these methodology considerations.

Transdisciplinarity requires the input of a plurality of perspectives, including non-academic knowledge, in the research design. Although some in Sustainability Science

have suggested that this requires a detailed process of co-production of knowledge between academic and societal actors, this thesis argues that approach is inappropriate for research on national policy. Instead an adapted process which used *consulting* transdisciplinarity was used. From this perspective a combination of academic and societal knowledge were used to frame the problem, identify new forms of knowledge and to evaluate the solution.

This thesis maintains that the aim of a Sustainability Science project is ultimately to identify knowledge that will have a contribution to a sustainable transition. As a consequence, the findings of this thesis have also been evaluated within the thesis itself. By considering the credibility, salience and legitimacy issues within this project, insight into the appropriateness of governmentality as a means to make sense of governance of ZW in Scotland will become apparent. It is hoped that this will help contribute to Sustainability Science research by providing a framework which can be used to understand governance of issues through national policy. The final three chapters of this thesis present, explain and evaluate the findings of this thesis.

5 Framing the Problem: A Definition of ZW in Scotland

5.1 Introduction and chapter outline

This chapter is concerned with governance goals and techniques that have emerged through the ZW policy. Considering the policy goals and the interventions implemented to reach those objectives, findings will be presented and analysed to contribute to the first aim of this thesis: to develop an understanding of ZW governance in Scotland.

To achieve this end, the chapter considers the first two research questions:

- 1) How is the policy goal of ZW *understood* in Scotland?
- 2) How is the policy goal of ZW *pursued* in Scotland?

The chapter is split into two parts. Part one (Section 5.2) looks at what the ZW policy is trying to achieve. It argues that ZW is conceptualised both as a defined target and as a philosophy of resource use. It is suggested that regardless of whether the ZW goal is viewed as a target or a change in mind-set, there is a general consensus on the scope of the policy, both in relation to the definition of waste and policy's importance to every stage of the production-consumption cycle. It is shown that these views are consistent with the presentations of ZW in the literature.

Part two (Section 5.3) considers the actions taken under the policy to promote the goal of ZW. Policy interventions are presented under the headings used by Davies (2008): policy documents, policy instruments, policy initiatives, legislation, and funding schemes. The links between the interventions and the scope and goals of the policy defined in Section 5.2 of this chapter are discussed in relation to the literature on waste governance. It is shown that many of these interventions are not necessarily new ideas (most have been used in other jurisdictions); however, taken together they suggest that Scottish ZW policy has comprehensively adopted techniques required for sustainable waste governance as identified by the literature.

The chapter concludes by stating that the ZW policy in Scotland has presented ZW as a more multifaceted term than previous academic studies have suggested. Despite the range of policy interpretations, it was found that the policy was coherent in terms of scope. It was argued that this scope represents a widening of policy considerations of

waste in Scotland, which in turn has necessitated new policy initiatives. It is suggest that these initiatives point to a shift towards more sustainable waste governance in Scotland.

5.2 Understandings of ZW as a policy goal

In Chapter 2 of this thesis it was submitted that ZW can be defined in a number of ways (see Section 2.3 p27). This section looks at how ZW has been defined in Scotland as a policy goal and is guided by the research question: how is ZW understood as a policy goal in Scotland? This section begins by offering further context to the establishment of the concept of ZW as a policy goal in Scotland. Using data primarily from the document analysis, it tracks the development of the term through the ZW Think Tank and consultation process, to its conclusion in the ZW Plan.

The section then goes on to consider the definition of ZW in a wider context, taking into account interviewees' perspectives on the goal, as well as further documentary data. The findings showed that ZW is conceptualised both as a defined target and as a philosophy of resource use. It was found that despite this difference, the scope for ZW governance was coherently presented within the documents and by interviewees.

5.2.1 Development of ZW in Scottish Policy

In January 2008, Richard Lochhead, Scottish Cabinet Minister for Rural Affairs and the Environment announced his plans for a ZW Scotland in which Scotland would become a “world leader in waste management” (Scottish Government, 2008a). The accompanying press release stated that:

“The aim of ZW is to maximise recycling, minimise waste and ensure that products are made to be reused, repaired or recycled back into nature or the marketplace.” (Scottish Government, 2008a)

It was not made clear where this definition of ZW came from, however, a later statement which tasked the ZW Think Tank with producing a Scottish interpretation of ZW, suggested that the concept emerged from the Japanese Total Quality Management System used by companies such as Toyota (Scottish Government, 2008b). This

supported the definition of ZW published in the, then current, National Waste Strategy for Scotland (Scottish Executive, 2003).

Minutes and reports from the ZW Think Tank suggest that prior to adoption of the plan, the concept of ZW, and what it might mean for Scotland, was discussed in depth. Think Tank members brainstormed their vision for a ZW Scotland and created a list of 14 characteristics associated with a ZW society (see Box 5.1 p137). In accordance with the Scottish Government's requirements (Scottish Government, 2008b) this vision was then crystallised into a singular definition of ZW in Scotland:

"ZW means reducing the unnecessary use of raw materials; re-using products where possible and recovering value from products when they reach the end of their lives either through recycling, composting or energy recovery." (Scottish Government, 2008c)

By the publication of the ZW Plan this definition had been developed into a mission statement:

"To achieve a ZW Scotland, where we make the most efficient use of resources by minimising Scotland's demand on primary resources, and maximising the reuse, recycling and recovery of resources instead of treating them as waste." (Scottish Government, 2010a:2).

Early on in this research project it became apparent that 'A Zero Waste Scotland' was not a universally understood or recognised goal. Initial interview request forms (see Appendix 1) included the question 'How would you define a ZW Scotland?' and number of interview candidates asked for clarification on this term. They believed that ZW Scotland was the delivery body for the ZW Plan and not a vision for sustainable resource management within Scotland. This indicated that the concept of ZW was not immediately associated with the ZW Plan. As a consequence, all interviewees were asked what ZW meant to them. The answers to these questions highlighted differences and ambiguities which were not apparent from the ZW Plan, nor existing empirical studies of ZW policies elsewhere.

Box 5.1 Think Tank Visions of Characteristics and Behaviours of a ZW Scotland

- Zero Waste is a business and economic opportunity for Scotland;
- Producer Responsibility has increased
- Consumers have the information they need to make the right choices;
- Carbon based decision making is understood and is the norm;
- The sustainable approach underpins everything;
- Society has developed a bottom up approach to governance of waste management;
- There is a focus on local solutions
- The planning system is streamlined and empathetic
- Building practices minimise waste;
- Effective conversion of bio-waste products to energy/delivers climate change and resource benefits;
- There are formal and informal financial incentives
- Wastefulness is designed out
- Everything is reused; and
- Policy is joined up

(ZW Think Tank, 2008a)

Moreover, the subsequent document review found that the Scottish Government's single definition of ZW was rarely used and where documents explained the concept of ZW, they often chose to do so in their own terms. These findings suggest that the policy goal of ZW in Scotland is contested and could be better understood by looking beyond the ZW Plan. This approach is further supported by the literature where it has been highlighted that in both waste (Watson et al. 2008) and ZW policies (Murphy and Pinceti, 2013) interpretation of policy strategies can differ in implementation. Zaman (2015:13) claims that the concept of ZW is often adapted to allow "working" definitions to be used in specific contexts. He found that the concept ranged from a "holistic" change in resource use to meaning ZW to landfill (ibid). This thesis also found that a number of objectives were included within the ZW concept.

5.2.2 ZW as a Target

Mirroring Zaman's (2015) findings, the objectives of the ZW policy were identified in the data as a specific target and as a wider philosophy for resource use. These goals were not mutually exclusive and most interviews showed that both definitions were represented simultaneously within ZW policy in Scotland, however, for the purposes of analysis it is useful to differentiate between the ideas.

One of the most common ways to understand ZW as a policy goal is to envisage the concept as a defined target and a number of interviews described the concept as such. However, there was a clear distinction made between the idea of absolute ZW (i.e. the elimination of all waste in society) and ZW as a predefined target for waste management: most usually interpreted as ZW to landfill (again echoing academic findings (Zaman, 2015)).

A number of interviews made reference to the impossibility of absolute ZW society, yet there was little in the documentary data to suggest that this was the goal. Admittedly earlier documents presenting ZW offered caveats such as “waste is unlikely to be eliminated completely in the foreseeable future” (Scottish Executive, 2003: 90) which might account for some ambiguity, but later documents - produced after the creation of the idea of a ZW Scotland - were much more clear. For example the ZW Plan itself states:

“what a ZW Scotland means – [is] not a country where we never throw anything away, but a new approach to making the most effective use of all resources, and avoiding wasting resources or making them unusable wherever we can” (Scottish Government, 2010a: v).

Nevertheless, within some interviews there was a concern that while most experts might recognise the aspirational nature of the ZW goals, the general public could misinterpret the idea as meaning the elimination of all waste. Some interviewees feared that this unrealistic goal would potentially undermine waste policy in Scotland. There are no studies that consider the public perception of the idea of ZW, nor have any empirical works considered the extent to which ZW is unrealistic. Instead research suggests that claims of absolute ZW objectives are usually confined to particular policy objectives (Young et al. 2010; Matete and Trois, 2008).

This ‘workable’ definition of ZW (Zaman, 2015) appears to be how many have interpreted the concept, with a number of empirical studies highlighting that ZW has come to mean particular policy targets. These targets most usually relate to recycling

and reducing waste to landfill (i.e. Murphy and Pincentl, 2013; Phillips et al. 2011; Zotos et al. 2010).

Targets play a visible role in the ZW Policy. Many of these targets are set by the EU. Earlier waste strategies stated that they were driven to achieve “European landfill reduction targets” (Scottish Executive, 2003:6) but the ZW Plan appears to move away from this rhetoric and instead presents Scotland as an ambitious achiever in waste management stating “the European target to cut the amount of biodegradable waste sent to landfill more than 4 years earlier than the deadline of 2013” (Scottish Government, 2010a: v). Data from the interviews, commissioned reports (Fogarty et al. 2008) and academic analysis (Tainsh, 2011) show that EU targets still play a key role.

Targets were identified for most levels of the waste hierarchy (see Box 5.2 p141). However, notably reduction targets were not included until the publication of later policy documents and, as yet, no national targets exist for reuse. The lack of visibility of the top end of the hierarchy is also reflected in the literature. Zaman’s (2014a) study of ZW indicators offers few – and questionable – examples for either reduction or reusing waste. Like the ZW policy, he equates waste reduction with consumption levels which contrasts with findings from other research which suggest that waste is not necessarily linked to consumption (Gregson et al. 2007).

In contrast to reuse, recycling targets were clearly identified and well communicated in the data. They were also the targets most readily associated with the ZW policy by the interviewees. This is a recognition perhaps that these are the targets that most closely correlate with EU objectives. EU directives were identified by interviewees as a key driver in Scottish waste policy; however, it should be noted that in most instances, the Scottish policy has set more ambitious targets than those legally required by the EU (see Box 5.2 p141).

Reasons for the predominance of recycling are not easily identified within existing literature. One potential explanation might be the relative ease by which concrete data can be collected on recycled materials. It was found that there was a strong focus in the research data on improving collections of technical information (i.e. volumes, weights, composition), a view that was also voiced by individual interviewees. Academic

literature also supports the notion that the waste industry both values and strives for better technical knowledge (Davoudi and Evans, 2005; Davoudi, 2006). Recycling data is usually calculated post-collection and so is presumed to be more accurate, more concise and more easily accessible than data on reuse or reduction. As a consequence, it is arguably easier to create and validate targets. This idea is supported in Zaman's (2014a) identification of ZW indicators where the largest category 'management' focuses most heavily on post-collection indicators. It is also supported by the work of Geng et al. (2012) who suggested that one of the major barriers to encouraging a more circular economy in China was the lack of relevant indicators for a closed-loop system.

Moreover, recycling as an 'end-of-pipe' process also marks the smallest shift in infrastructure or organisation and so represents a low-hanging fruit option for both local authorities and individual businesses. This theory is by supported by Watson et al.'s (2008:494) observation that existing policies "largely reproduce the political and institutional framing of municipal waste that developed under the disposal paradigm" which they suggest has led to a focus on recycling. Recycling targets may therefore predominate because they are also the easiest to achieve.

Whilst the goals for recycling were found to be clear, energy recovery targets were more ambiguous. Despite the ZW Plan clearly stating that "ensuring energy from waste treatment is only used to recover value from resources that cannot offer greater environmental and economic benefits through reuse or recycling" (Scottish Government, 2010a: 10), for the interviewees ambiguity surrounding this method remained. The ZW Plan notes that the existing 25% cap on municipal waste for EFW would remain in force but be subject to future review. This opinion was confirmed in *North Lanarkshire Council v The Scottish Ministers and Shore Energy* [2013] CSIH 58 which considered both the question of national targets and sources for EFW plants. It was thought by some interviewees that this limit to EFW a barrier to achieving ZW goals.

Box 5.2 Key Targets Associated with ZW Policy

Waste Hierarchy	Target	Source
Reduce	7% reduction on waste arisings by 2017 (baseline year: 2011)	Safeguarding Scotland's Resources (Scottish Government, 2013:12)
	15% reduction on waste arisings by 2025 (baseline year: 2011)	
Reuse	No targets identified	N/A
Recycling	40% (2010) 50% (2013) 60% (2020) recycling rate for household waste by 2010	Zero Waste Policy Announcement (Scottish Government, 2008a)
	50% of household waste to be recycled or reused by 2020	EU Policy (Waste Framework Directive 2008/98/EC)
	70% recycling rate for Construction and Industrial Waste by 2020	
	70% recycling rate for all Scotland's waste by 2025	ZW Plan (Scottish Government, 2010a)
Recovery	No targets specified	N/A
Landfill	Limit of 1.26 million tonnes of biodegradable waste to landfill by 2020 (Council Directive 1999/31/EC)	EU Policy (Council Directive 1999/31/EC))
	Limit of 5% on all waste to Landfill by 2025	ZW Plan (Scottish Government, 2010a)
	Ban on biodegradable municipal waste to landfill by 2021	Scottish Government Regulations (Waste (Scotland) Regulations 2012)
	70% recycling rate for Construction and Industrial Waste by 2020	EU Policy (Waste Framework Directive 2008/98/EC)

The reluctance of the Scottish Government to engage with discussions over specific targets for EFW is explained by the literature as a potential reflection on the controversy which surrounds EFW facilities. Historically associated with pollution and health consequences (Clark, 2007a), EFW or incineration of waste has attracted public criticism both in Scotland and elsewhere. It is widely recognised in both policy and academic literature that objections are often based on out dated assumptions which do not reflect technological advances (i.e. Sustainable Development Commission Scotland (SDSC), 2007; McCauley, 2009; Tainsh, 2011) but yet the topic remains politically contentious. The EIA of the ZW Plan (Scottish Government, 2010b:4) suggests that the

level of public concern is such that “the levels of anxiety and concern about health implications experienced by the local community (regardless of the accuracy or validity of these concerns)” posed a potential risk to the public. Moreover literature suggests that EFW is viewed by many as incompatible with goals of ZW (Connett, 2013; Zaman, 2015). However, within the Scottish context, both Tainsh (2011) and the SDCS (2007) suggest that EFW should not be seen as a barrier to but a complement to Scotland’s recycling targets.

In contrast and in sync with ZW goals, the ZW policy appears to be clear that reducing waste to landfill is a key goal. Targets that relate to both general and specific waste streams were identified (see Box 5.2 p141). Regardless of what stage of the waste hierarchy they focus, these targets show that there is a clear policy aim to reduce waste to landfill and encourage a move up the hierarchy for waste management. This suggests that ZW goals are, at the very least, a shift away from waste governance as waste disposal to resource management.

It was recognised within the interviews that targets are a central focus for many in the ZW policy and yet there was also a concern that efforts to reach these targets would overshadow the more transformational goals of ZW. Academic work has also highlighted the limitations of target-setting; Watson and Bulkeley (2005:423) suggesting that the “pursuit of targets” leaves little space for the type of reflexive practices that engage with the “deeply embedded systemic issues, economic and cultural dynamics that underlie ever-growing volumes of waste production”. Interviewees were also aware of the limitations of targets and within the interview data there was a clear opinion voiced that prescribed and quantifiable targets should not be substituted as the main goal of the policy. Most interviewees believed that ZW should be seen as much as a new philosophy of resource use as a pre-identified or quantifiable goal.

5.2.3 ZW as Philosophy of Resource Use

The idea of a ZW philosophy emerged in a number of interviews. Discussions presented a spectrum of new ideas, ranging from a redefining of ‘waste’ to ‘resource’ to a systemic change towards a ‘circular economy’. A select few interviews took the idea a

step further and considered whether ZW questioned existing economic practices and offered a changed perspective on value.

The most discussed conceptualisation of ZW was that of visualising waste as something of worth, particularly as measured in terms of economic value. In this sense, interviewees suggested that ZW offered a shift from management of waste to management of resources. This idea is echoed in many of the documents where ZW was presented as a scenario in which “all waste is seen as a resource” (Scottish Government, 2010a:1). The mind-set that permitted valuable resources to be burned in the ‘coup’⁵ or discarded in landfill was presented by most interviewees as something of the past. This mirrors academic work which highlights sustainable waste management as a move towards “waste as a resource paradigm” (Watson et al. 2008:486) and identifies a shift in modes of waste governance from disposal to waste as a resource (Bulkeley et al. 2007).

For some interviewees this shift of mind-set went beyond seeing waste as potential resource and involved a higher degree of critical analysis of the processes that produce such waste. Most interviewees suggested that ZW as a philosophy was not just about revaluing the end-of-pipe emissions but also actively reconsidering the production models which produce waste in the first place. As a consequence ZW was seen as a design principal and closely linked to the idea of a closed-loop system of production: an observation that accords with academic descriptions. Interview data⁶ highlighted that ZW as a philosophy is often associated with the idea of a circular economy.

A concept predominantly developed in civil society, The Ellen MacArthur Foundation (EMF) describes the circular economy as:

“an industrial system that is restorative or regenerative by intention and design. It replaces the ‘end-of-life’ concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the

⁵ The ‘coup’ is a Scots term for the rubbish tip

⁶ This data was further supplemented by observed discourse at conferences and in discussions and publications that occurred after the period of data collection.

elimination of waste through the superior design of materials, products, systems, and, within this, business models” (EMF, 2012:7)

Frequent reference to EMF was made in the interviews, however, it was recognised that the concept of the circular economy had only recently begun to play a role in ZW policy. The ZW Plan (Scottish Government, 2010a) did make some reference to closed-loop systems but it was not until the creation of The Resource Efficient Scotland programme, that the Government formally linked the ideas of the circular economy to ZW policy. This accompanying policy publication clearly stated that:

“Safeguarding Scotland’s Resources is the Scottish Government’s programme to reduce waste and create a more productive and circular economy. It forms part of the Government ZW agenda and our economic strategy.” (Scottish Government, 2013a: 3)

Although recent research suggests the circular economy could benefit from socio-political analysis, both conceptually and empirically (Hobson, 2015) the concept has mostly been explored within academic literature as a political idea as it has emerged in China⁷ – where the idea has become a feature of national resource policy in response to growing consumption, population and natural resource use (Yuan and Bi, 2008:4). In China the policy has been developed as “a mode of economic development based on ecological circulation of natural materials” (Zhijun and Nailing, 2007:95) which focuses heavily on eco-efficiency and cleaner production (Matthews and Tan, 2011; Geng et al. 2012).

Cleaner production and eco-efficiency were easily identified as part of the objectives for the ZW policy in both the documents and the interviews and a corresponding focus on the economic and environmental benefits of the policy also emerged from the data. This leads to the conclusion that the circular economy forms a significant part of the philosophy of resource use that is the objective of the ZW policy. However, few interviewees considered the circular economy as synonymous with ZW and some recognised that interpretations of the circular economy may do little to curb or question

⁷ The relevance of this literature to the Scottish context can be questioned here. China operates on a much larger economy of scale, with access to different resources and infrastructure.

overall consumption. As one interviewee described: a closed-loop system that produces trainers for hamsters is not necessarily what you would consider appropriate in a ZW society. It would be false to suggest that critical evaluation of consumption practices and economic models were a central discussion in the data. The issue of consumption was not clearly identified in any documents and whilst touched upon by individual interviewees, was usually briefly mentioned only in relation to the obvious limitation (and for some, contradictions) of the ZW Policy.

The lack of attention given to the idea of ZW as a limit to consumption can also be identified in the academic literature where Zaman (2015:17) notes that “surprisingly a scarce number of studies adequately addressed the problems and challenges associated with overconsumption and waste problems”. Bulkeley and Askins (2009:258) have also argued on a more general level that current waste management strategies “do little to challenge prevailing ideas about waste and waste practices”.

The values and ideas promoted through the ZW policy will be further explored using governmentality in Chapter 7 of this thesis. However, even on an empirical reading of the data, it can be seen that one of the goals of ZW is to think about resources differently. This objective can encompass both a reimagining of production systems (as in the circular economy) or a larger reconsideration of the concept of waste. What was clear from the interviews was the belief that this philosophy of resource use should extend across the production cycle and throughout society, and so the scope of the policy was also identified as an important and coherent theme.

5.2.4 The Scope of ZW Policy

The data suggested that the structures, institutions and practices of waste governance in Scotland were seen as being insufficient to manage and account for waste as a resource. The interviewees suggested that this was – in part – a consequence of the limited consideration of the source and type of waste within past policies. Leading from this there was a clear emphasis that a goal of the ZW policy should be to expand the scope of waste governance in Scotland to engage with a wider range of stakeholders looking at all waste streams at every stage of the production-consumption cycle. Conversely, the scope of ZW was the area in which interviewees voiced most limitations of the current

policy; with some suggesting that there was not a wide appreciation of the concept and in many instances there was no depth of understanding of the idea.

There were two discussion points identified which clearly considered the depth of ZW policy integration; one related particularly to waste streams and the other to consideration of appropriate intervention points in the production process. Within the documents, the importance of ZW policy applying to both municipal and commercial waste was widely noted. The ZW Plan explicitly states that: “this new approach will apply to all resource streams, not just municipal waste” (Scottish Government, 2010a: 9). This is a marked change from the first announcement of the ZW initiative where the focus was predominantly on municipal waste targets (Scottish Government, 2008a). The inclusion of all wastes seems to have occurred as part of the ZW Think Tank discussions prior to the release of the ZW Plan, partly in recognition that municipal waste constituted only 20% of Scotland’s Waste arisings (i.e. ZW Think Tank, 2010a). The interviews also pointed to the necessity of inclusion of all waste sources in the ZW Plan. They highlighted the over-emphasis on municipal waste and suggested was a legacy of past waste policies.

These arguments are mirrored in the academic literature where empirical studies show that there is a focus on municipal waste in ZW policies and academic work. Zaman (2015:15) found that municipal waste studies accounted for 47% of academic work. Similarly Gregson and Crang (2010) highlight the potential overemphasis on municipal waste in academic studies. Conversely elsewhere literature notes that ZW policies must consider the “whole system” (Curran and Williams, 2012: 3). This (alongside common sense) suggests that all sources of waste should be included in a ZW scenario. However, in contrast to the interview data in this project, there has been little discussion of the disconnect between the focus on municipal waste and sustainable waste management goals in academic literature. This supports Davoudi’s (2006) claim that waste policy has developed more quickly than academic research.

In contrast, sustainable waste management literature has focused heavily on the importance of the consideration of a closed-loop system of production where waste, efficiency and resource use is considered at all stages of manufacturing and consumption. Section 5.2.2 (p137) of this chapter identified that a closed-loop approach

was also deemed to be of importance in the ZW policy. However, whilst most interviews touched upon the importance of a full system approach, it was found that the focus of discussion was still predominantly on end-of-pipe solutions.

Zaman's (2015) review also found that despite a promotion of the closed-loop idea, there was a predominance on end-of-pipe studies and policy applications, leading him to suggest that at the moment ZW means ZW to landfill. This was not the case in Scotland; however, it would not be inaccurate to suggest that there appears to be less focus on design, manufacture and consumption issues and more on collection, recycling and disposal.

This could be explained by the historical association with these processes and waste. Hetherington's (2004) research on the concept of disposal finds that the idea is often reduced to waste and conceptualisation tends to focus on disposal as part of a linear system. There was some suggestion from the ZW policy arena that the converse is also true. At the Scottish Waste Conference (2012), the plenary session questioned whether the 'waste' in ZW undermined the policy goals to move beyond end-of-pipe waste. In this sense it would appear that 'waste' in Scotland has become synonymous with discard. An effort has been made to overcome these limitations by expanding ZW ideas beyond the waste industry. The data also suggested a strong support of the idea that the ZW policy should be broadly adopted across government and society both in terms of engagement with stakeholders and cross-policy domains.

Business, community groups, individuals, local authorities, charities, government agencies and the Scottish Government all were identified within the research data as being central to ZW policy. The ZW Plan definitively states that "a ZW Scotland will need commitment and resolve from every one of us." (Scottish Government, 2010a: v). Previous plans also made reference to the importance of involving all stakeholders (Scottish Government, 2003), but there is evidence of a definite progression towards a more open and less expert style of communication could be seen in comparison of this earlier waste strategy and ZW Plan (Scottish Government, 2010a). The latter was not only shorter and uses less technical language but also has less emphasis on measuring and monitoring waste. Development of the ZW Plan is discussed in more detail on p 150 of this chapter.

Despite apparent attempts to make the policy more accessible, a number of interviewees believed that the idea of ZW was not well known outside of the waste industry. Interviewees thought that where the policy was recognised and understood within business the most active actors were large businesses, with smaller businesses too focused on economic constraints to worry about waste policy. Similarly it was suggested that levels of understanding also varied across local authorities, with some interviewees claiming that certain councils really got ZW whilst others still continued to see waste as a burden to be dealt with. Tellingly those local authorities deemed to understand the concept (Clackmannanshire, Stirling, Fife) correlated with the areas with the highest recycling rates, which speaks to findings on p137 of this chapter.

Empirical studies would seem to support that sometimes the idea of ZW is lost in the application with policy in practice not reflecting the environmental goals of ZW (Phillips et al. 2011; Murphy and Pincetti, 2013). However, academic interpretations of sustainable waste management also present the notion that strategies must be widely adopted across society to ensure success (Bull et al. 2010; Watson et al. 2008).

Academic literature has also suggested that sustainable waste management requires cross-policy integration (Costa et al. 2010; Lehmann 2011; Clay et al. 2007). This project identified linkages to economic, planning, environmental, and health and safety policies. One of the more recent publications clearly states that the ZW Plan “is an economic and a resource strategy – not simply a waste strategy” (Scottish Government, 2013a p8). However, some questions were raised within the interview data about how successful this integration was in operation.

Links with the planning system raised particular concern. Despite the then relevant Scottish Planning Policy (Scottish Government, 2010b:8)⁸ aiming to “support the achievement of ZW objectives, including the provision of the required waste management installations”, lack of knowledge amongst planning officials and poorly constructed local plans in relation to waste and resource management were considered by interviewees to be a barrier to implementation of the ZW policy. Additionally some

⁸ This policy was superseded by Scottish National Planning Policy 2014

interviewees raised questions about the cross-departmental knowledge of waste in their own professions and organisations, even where these were environmentally focused. It was felt that waste remained in silos and a niche concern for many environmental governance actors in Scotland.

There has been little academic research which explicitly considers this concern. No studies have reviewed other policies compatibility with ZW nor have there been many qualitative investigations as to the understanding of waste issues within environmental governance. Studies have reviewed the context of sustainable development policies (including in Scotland (see Russell and Thomson, 2009)) and identified waste as a factor, but the researcher could not find any literature which used ZW as a lens through which to evaluate other policies. It is suggested this could be an avenue for further research.

5.2.5 Summary Response to Research Question

This section investigated the question: How is the policy goal of ZW understood in Scotland? Findings highlighted that the development of the ZW policy encouraged the adoption of a short official definition of ZW. It was stated that this definition is rarely used and instead the ZW policy goal has come to mean a number of things.

In the first instance the goal is associated with a target. Reflecting other academic findings, this target can often be reduced to ZW to landfill and an increase in recycling: in part because targets at the higher end of the waste hierarchy are less established. However, it was also argued that whilst ZW is readily associated with these targets, those interviewed in this thesis rarely reduced the policy to ZW to landfill. Instead the ZW policy objective was seen to be a shift in the mind-set of a new philosophy of resource use. This philosophy encompassed a range of perspectives from waste as a resource; the importance of a circular economy and as a critique of the consumption society. Whilst the form of this philosophy differed, it was found that there was a consistency of how waste was construed within it. The scope of the ZW policy was taken to mean all waste, seen as relevant to all stages of the production process and deemed applicable to all groups in society. It was suggested that this mirrors the critiques of waste policy in the literature.

These findings show that the policy goal of ZW in Scotland is more critically and reflexively constructed than might be expected from accounts of ZW policies elsewhere. The policy objective of ZW is not only to reduce waste but also to examine the ways of thinking about resource that cause waste in the first place. One of the ways in which the policy seeks to do the latter is by expanding the scope of the policy.

In this sense the policy objectives can be seen as:

- i) reducing waste
- ii) encouraging a new perspective on resource use
- iii) expanding the scope of waste management in Scotland

The next section of the chapter will consider the policy interventions designed to achieve these aims.

5.3 How is ZW promoted in Scotland?

This section builds on the definition of ZW from section 5.2 of this chapter and discusses how the ZW policy has been implemented in Scotland. The chapter presents the explanations behind a number of actions (see Box 5.3 p152) that have been introduced as part of the policy. These policy interventions are reflected upon using literature and the discussions in Section 5.2 of this chapter to answer the question: how is the policy goal of ZW pursued in Scotland?

Davies (2008) presents five categories for policy intervention and a ZW policy action has been identified in relation to each of these actions. Although numerous techniques are used to govern waste management in Scotland, focus is placed upon interventions that occurred as a consequence of ZW policy. It is suggested that these policy interventions present a move towards a broader and more inclusive style of waste policy.

5.3.1 Policy Documents

The ZW Plan was published on 9 July 2010 (two years after the initial policy announcement). This strategy document was further supplemented by the publication of *Safeguarding Scotland's Resources: A Blueprint for the Circular Economy* in 2013. This latter document was published late into the data collection period for this project

and so appeared after most of the interviews had been conducted. Nevertheless later interviews still spoke more of the importance of the ZW Plan and as a consequence this section will focus predominantly on that document.

The ZW Plan is not Scotland's first national waste plan; this was produced by SEPA in 1999. This document was predominantly linked to EU landfill targets and alongside 11 (more local) Area Strategy Plans, and a consultation between the Scottish Executive, SEPA and Local authorities, which formed the basis of the 2003 National Waste Plan (the '2003 Plan') (Scottish Executive, 2003). The 2003 Plan was extensive (it is 135 pages long) and sought to cover existing waste management arrangements (for both municipal and non-municipal waste), best practice, the actions required to implement the 2003 Plan, and the future development of waste management in Scotland. Its vision was "a resource-efficient culture where waste reduction, reuse and recycling are a part of everyday life for everyone" (Scottish Executive 2003:4). Arguably this is a definition that also sits with ZW aspirations.

Box 5.3: Policy Interventions for ZW

Policy Document	ZW Plan	2010	First ZW Strategy for Scotland Outlines strategic direction and action for 4 areas: <ul style="list-style-type: none"> • Resource Streams • Economic Opportunity • Resource Management sector • Education and Awareness
	Safeguarding Scotland's Resources: Blueprint for A Circular Economy	2013	Supplementary policy document Focus on advice for Business and Public Sector in 6 areas: <ul style="list-style-type: none"> • Business and Resource Efficiency • Stimulating Innovation and Business Opportunities • Sustainable Product Design • Producer Responsibility • Understanding the Movement of Materials in our Economy • Creating a Culture of Resource Efficiency
Policy Instrument	ZW Scotland	2010	Delivery Body <ul style="list-style-type: none"> • Undertakes Research • Provides Funding • Education and Tools
	Waste Discover Data Tool	2014	Online visual analysis of waste generated and managed in Scotland
Policy Initiative	Zero Waste Scotland Volunteers	2011	Local Volunteer Task Force to disseminate information for individuals and householders
	Revolve ReUse Quality Standard	2011	Accreditation Scheme for Reuse Service Providers
	Resource Efficient Scotland	2013	Advice and Support Programme for Organisations on Water, Waste and Energy
Legislation	Better Waste Regulation	2008	A revised programme for Scotland's Waste Regulation based on waste as a resource
	Waste (Scotland) Regulations 2012	2012	Came into force in 2014 Expanded Business, Local Authority and Organisations duties to collect and separate food waste. Placed a ban on biodegradables to landfill by 2021
Funding Schemes	Plastics Reprocessing Fund	2008	Loans and grants for investment in Plastics Reprocessing
	Research Grants and Tenders	2010	Funding Opportunities for Innovation

The ZW Plan was also thought to be driven, in part, by European requirements; the 2008 Waste Framework Directive (Directive 2008/98/EC) required that Member States introduce a national waste prevention programme which the ZW Plan appears to be. On the other hand from a reading of the documents it is not clear why the 2003 Plan would not fulfil this objective. The ZW Plan introduces more ambitious targets and offers a far clearer vision of ZW, but it was also found that many of the actions contained within the ZW Plan are very similar to those found in the 2003 Plan. Interviewees also noted that the ZW Plan offered a continuation of many existing initiatives including a focus on recycling targets, appreciation of both municipal and industrial waste, more efficient regulation, involvement of all stakeholders, increased landfill bans and better waste data.

The obvious difference between the 2003 and ZW Plans is found in the rhetoric and communication style, rather than in content. On announcement of the initiative, Cabinet Secretary Richard Lochhead acknowledged the recent improvements in sustainable waste management in Scotland but stated:

“There is much more we need to do if we are to truly make a difference locally and globally and today we are setting out our new waste policy to make Scotland greener and a world-leader on waste management’ (Scottish Government, 2008a)

These ambitions were not apparent from the 2003 Plan where the goals were more modest and included “challenging but realistic objectives for the sustainable management of Scotland’s waste” (Scottish Executive, 2003:12).

A number of interviewees questioned the ZW Plan on its tactics and, at first sight, the 2003 Plan does appear to be a far more detailed strategy on how to achieve its goals. It includes costings, information on local arisings and infrastructure capacity and outlined extensively processes of measuring and monitoring waste. The ZW Plan in contrast included far less information (excluding Annexes, the document is just 14 pages long) and focused on outlining the vision, meanings, and key targets for a ZW Scotland. This lack of detail was perhaps what encouraged some interviewees to suggest that the ZW

Plan was a Scottish National Party (SNP) project. Certainly there is potentially more than a coincidence that the ambitious ZW objectives and announcements have emerged at the same time as the election and continued success of the SNP, giving the ZW idea a long-term championing by Richard Lochhead: who, thus far, has been Cabinet Secretary responsible for ZW for the entire duration of the policy.

On the other hand, it was found that dismissing the ZW Plan as a PR fluff exercise is not an accurate depiction of the policy's development, and it should be noted that despite criticism (and perhaps some cynicism) from some interviewees, ZW as a PR exercise was not a predominant theme in the interviews. Moreover, the comprehensive multi-stakeholder approach to the ZW Plan development, including the ZW Think Tank and public consultation suggest that this was a well-informed policy document. As a consequence it could be concluded that, unlike the 2003 Plan, which arguably sought to be all things to all people, the ZW Plan presents a statement of vision rather than a strategic plan of action, reflected by its own claim to be "deliberately concise and strategic in its approach" (Scottish Government, 2010a: vii).

Some interviewees were uncomfortable with the lack of detail in the ZW Plan and admittedly it is difficult to identify any specific programme of delivery. It is not geographically based on local authorities (the traditional scale at which waste has been managed in Scotland); it considers all types of waste and there is a less obvious differentiation between municipal and commercial waste than in the 2003 Plan. Similarly whilst the importance of improvement in waste data collection is noted on numerous occasions in the ZW Plan, the technical methodological details are included in a short annex, rather in the full body of the text. This adds to the accessibility of the document and is perhaps a reflection that the ZW Plan involved a wider and less expert consultation process than the 2003 Plan.

It could be argued that the streamlined approach of ZW Plan is more compatible with academic opinions on sustainable waste management. Seadon (2010) suggests that conventional waste management approaches are concerned with technical details, focus on specific problems and do not adopt systemic long-term thinking. He argues that sustainable waste management is best understood by multiple actors with a shared vision, who appreciate that the dynamic system will not operate through linear

development. His suggestions for the type of management that might approach such a system: flexibility, widened scope and self-organisation speak more to the opportunities available under the ZW Plan.

The multi-stakeholder ZW Think Tank and public consultation process which was used to form the ZW Plan also represents a change in approach which is in line with academic literature. In her work Davies (2003, 2005, 2008) uses the example of Ireland to show that a central government led waste policy, with little meaningful input from civil society, can invoke conflict and cause barriers in the implementation of sustainable waste policy, particularly in the planning and development of new infrastructure.

Linked to this, scale has also been deemed important in waste policy interventions. Most sustainable waste strategy analysis has reviewed the assimilation of the policies using the framework of environmental policy integration and suggested that historical practices and existing institutions can limit the potential of otherwise paradigm shifting policies (Nilsson et al. 2009; Watson et al. 2008). In reviewing Swedish policies Nilsson et al. (2009:14) found that local plans often muddled the waters of policy integration and they advocate instead a “closely managed, consistent, and coordinated system” as an alternative. The ZW Plan represents a move from more local planning to a centralised, but yet multi-stakeholder developed, strategy.

ZW literature has not considered the development and content of ZW strategies in great detail: all empirical cases have been at a city or regional level and studies have tended to focus on implementation rather than strategy creation. However, a recent paper by Cole et al. (2014) sought to record the strategy development process of a ZW strategy for a local authority in England. They present a consultation process that appears very similar to that undertaken by the Scottish Government (think tank, draft, consultation, review, policy). Moreover they make the observations that “ZW is difficult to achieve without clear management policies in place... [which] include social and environmental aims alongside waste management performance targets” and that policies should “establish a link between all stakeholders to produce a holistic approach” (p74). This aspiration appears to support the approach of the Scottish ZW Plan.

Nilsson et al. (2009) and Davoudi and Evans, (2005) have identified that the emergence of this new ‘resource’ focused policies has led to a degree of confusion over responsibilities of the actors involved, with the latter paper finding that an increase in actors has resulted in “institutional fragmentation” (p511). Watson et al. (2008) have also found that these types of policies can result in a “breakdown of institutional integration”. To a certain extent this has been addressed in Scotland by the other major ZW policy development, the creation of the policy instrument ZW Scotland.

5.3.2 Policy Instruments

Two policy instruments were identified within the research data. The most recent, *The Waste Discover Data Tool*, was initiated well into the data collection period and was rarely referenced by any interviewees. The tool is an online database which seeks to allow “visual analysis of waste generated and managed in Scotland” (SEPA, N.D.). It focuses on waste streams and provides much of the same quantifiable and technical data of previous SEPA waste reports, but in a more manageable and accessible form. The lack of attention given to the tool in the research data and the limitations of its development of waste understandings in Scotland, suggest that it is an indicator of a previous approach, rather than an innovative practice. In contrast, the other identified policy instrument, the creation of the ZW Scotland organisation offers more evidence of a new way of thinking.

The story behind the creation of ZW Scotland as an organisation is somewhat murky. No clear history is apparent from documents and some interviewees were reluctant to discuss the topic (although it should be noted that the majority of interviews focused on the actions rather than creation of ZW Scotland). ZW Scotland began life as part of WRAP⁹ (Waste and Resources Programme) a charity registered in England which claims to:

“uniquely and by design, in the space between Governments,
businesses, communities, innovative thinkers and individuals –

⁹ In 2013 ZW Scotland was registered as a Scottish subsidiary company of WRAP. In 2014 it was announced that ZW Scotland had become a company independent of WRAP (ZW Scotland, 2015). This change highlights a number of developments that have occurred with ZW Scotland after completion of the data collection period of this thesis.

forging partnerships and developing ground-breaking initiatives to help the UK use resources more sustainably” (WRAP, 2015).

Initially entitled WRAP Scotland, ZW Scotland was the delivery programme created by WRAP to deliver the Scottish Government’s ZW Plan (WRAP, 2011:15). Early announcements made it clear that this programme was to be delivered by one organisation which would replace six existing waste programmes (Scottish Government, 2010d). This was said to be a direct result of the ZW Plan consultation where 77% of respondents thought that a single delivery body for the ZW programme would bring improvement in Scotland’s waste policy (Scottish Government, 2009b: 21). There was feeling amongst some interviewees that this process had not been delicately handled, but on the whole, most supported the amalgamation of the waste organisations as a means of simplifying delivery and providing a one-stop shop.

ZW Scotland’s director Iain Gullane claimed that the consolidated organisation would:

“enable us to deliver better and more efficient services to consumers, local authorities and businesses... give greater clarity to those seeking advice and support on ZW and...mean services will be better integrated and able to benefit from economies of scale” (ZW Scotland, 2010)

Somewhat undermining the clarity objective, the ZW Plan (Scottish Government, 2010a) uses ZW Scotland interchangeably to mean the programme, future Scotland and the delivery body. Nevertheless, the ZW Plan did offer a brief outline of the role of the organisation. Despite its short history the remit of ZW Scotland has extended significantly. Some of these increased responsibilities were created in the period after the data collection of this thesis¹⁰. However, even with the 4 years considered in this project, the organisation went from being primarily tasked with measuring and monitoring waste and administering specific programmes, to being the main source of education and practical tools on resource efficiency, as well as providing continued support for sustainable resource management in Scotland.

¹⁰ In 2014 ZW Scotland announced that it had “Joined forces with ‘Team Scotland’ - the publicly funded bodies delivering the Scottish Government’s vision and goals” (ZW Scotland, 2014:1). Team Scotland consists of the Scottish Government, SEPA, Scottish Enterprise, Highland and Island Enterprise

As part of this increased remit, ZW Scotland now has responsibility for disseminating resource efficiency advice (water, energy and waste) to businesses and the third and public sectors through its Resource Efficiency Scotland programme. The development of this programme again marked a consolidation process with this work previously having been undertaken by ZW Scotland, Carbon Trust and Energy Savings Trust. The creation of this programme coincided with the publication of the additional strategy document: *Safeguarding Scotland's Resources: A Blueprint for the Circular Economy* (Scottish Government, 2013). This is further discussed in subsection 5.3.3 of this chapter (p160).

Opinions on ZW Scotland from the interviews were on the whole neutral and guarded but a small group did question the expanding responsibilities, particularly in relation to the accountability of the organisation. At the moment ZW Scotland continues to be publically funded and has an annual budget of approximately £23 million. Some interviewees raised questions about how that money was spent and how the performance of ZW Scotland was evaluated. One interviewee went as far as to suggest it was private company cashing in on Government tenders. The organisation publishes its own targets (ZW Scotland, 2011b) and is accountable to the Scottish Government, but it was still felt by some interviewees that their approach to policy implementation was piecemeal and lacked clarity.

This criticism was, in part, linked to another observation commonly made about ZW Scotland. A number of interviewees questioned the technical waste experience of those in ZW Scotland. Interestingly this criticism came largely from those who did not work directly with the agency. Representatives of SEPA and other partner organisations, on the whole, thought they worked well and effectively with ZW Scotland. Moreover representatives of ZW Scotland noted that their colleagues had extensive experience of the third sector and local authority waste management. This brings to light observations on knowledge use within the ZW policy.

The ZW policy itself seems to aspire to develop knowledge based on human behaviour and networks of stakeholders in addition to the more technical material flow information which has traditionally been the basis for waste management policy. A

number of interviewees did promote the need for holistic understanding of the waste system, however, more detailed analysis found that there was still a predominance given to waste models, statistics and quantitative data. Davoudi (2006) researched the use of knowledge within waste policy in the UK and found that problem-setting (as opposed to problem-solving) and social dimensions (in contrast to technical elements) were neglected or undervalued. She also found that non-experts (often representing civil society rather than waste bodies) who presented subjective knowledge lacked influence. This mirrors the concerns that appear to form the basis of the interviewees' scepticism of ZW Scotland.

Some of the doubt over the role of ZW Scotland might also be linked to the idea of the confusion brought by institutional change and new actors. In an earlier study Davoudi and Evans (2005) found that Regional Technical Advisory Bodies – bodies created to deliver waste policy at local levels in England – suffered from lack of social capital because as a new organisation they had no history of interaction. In her study of Sweden, Finland and the UK (England) Berg (2011) found that these sustainable consumption type policies were often outsourced to other non-governmental bodies. She suggests that this is sometimes unavoidable but that this new form of actor can raise questions over responsibilities of the actors. The kind of role played by ZW Scotland is new, and beyond the work of Davoudi (2005, 2006) and Berg (2011) very little was found in academic literature about these kind of actors in waste.

A number of studies have briefly identified that “government agencies” (Clay et al. 2007: 785) and “delivery bodies” (Tudor et al. 2011: 59) are apparent features of sustainable waste management policies, however, despite studies stating consideration of policy integration must go beyond traditional institutions (Watson et al. 2008) most waste governance studies have taken scalar perspectives looking at interactions between international, national or local level organisations. Full investigation of the roles played by more boundary organisations or the practices and understandings of waste within them have yet to be undertaken.

It was found in this project that the goals of ZW Scotland to work with stakeholders across national, local and household levels point to a new and more holistic style of waste management. Similarly the integration of water and carbon responsibilities also

show a broader integration of waste policy. The discomfort felt by the interviewees as to the actions of ZW Scotland, also suggest that the organisation marks a significant change in waste management in Scotland. ZW Scotland is also responsible for the implementation of policy initiatives and more information on their role can be taken from examination of these actions.

5.3.3 Policy Initiatives

Three key policy initiatives were identified within the interviews, although notably only one (Resource Efficient Scotland) was mentioned in any detail in the policy documents. As a consequence further information about these initiatives was taken from press statements. There appears to be few common themes in the initiatives, except that they are administered by ZW Scotland. This supports the belief of some more critical interviewees that ZW Scotland adopts a piecemeal approach to delivery. However, on closer inspection, the initiatives appear to be designed to address specific problems identified both within waste governance in Scotland and elsewhere; the development of reuse; policies tailored for the household level; and communicating with business.

Revolve Labelling Scheme

Development of a labelling system for second-hand white goods and furniture was an early recommendation of the ZW Think Tank Delivery subgroup (2010b: Action 8), however, the idea did not appear in either the ZW Think Tank summary report (2008c) nor explicitly through the ZW Plan (Scottish Government, 2010a). Nevertheless, in 2011, ZW Scotland in conjunction with Community Reuse Network Scotland (CRNS) announced the Revolve Re-Use Quality Standard (the ‘Revolve Standard’) which aimed to “develop a comprehensive reuse infrastructure across Scotland” (CRNS, 2011: 8) by raising confidence in reuse products.

The Revolve Standard is an accreditation scheme with 5 objectives (see Box 6.4 p161). At the time of research, 25 reuse projects were taking part in the scheme, a representation of around half of projects which have sought accreditation for their work (CRNS, 2011:23). The Revolve Standard operates a website where customers can search for accredited suppliers of specific goods, and also provides a labelling scheme

to allow customers to identify Revolve accredited businesses on sight (see Box 5.4 p161).

Box 5.4: Revolve Reuse Quality Standard

Revolve represents:

- a. Commitment to quality
- b. Expert Reconditioned Products
- c. Safety Tested Products
- d. Regular Training and Quality Audits
- e. Doing the Right Thing

(ZW Scotland, 2012c)

The number of interviewees who spoke about the Revolve scheme was low in comparison to other policy initiatives, but those who did chose to speak about it considered it a very important aspect of encouraging reuse in Scotland. The lack of discussion of the initiative is thought to be indicative of the low visibility of reuse in general.

In contrast to policy level engagement, the encouragement of reuse behaviour is seen as a key component of a ZW lifestyle (Connett, 2013) and yet ZW academic analysis has yet to engage with this aspect in any real sense. There has been an acknowledgement that second-hand stores can provide infrastructure for reuse and offer an indicator of ZW within an urban environment (Zaman, 2014a) but beyond this, the topic of reuse appears under-discussed. Waste governance literature also notes the lack of policy initiatives to promote reuse (Bulkeley and Gregson, 2009; Lane and Watson, 2012).

The Revolve project is not only notable for its attempts to delivery policy for reuse, but also in the way it has developed these actions. Bulkeley and Gregson (2009) suggest that reuse is multifaceted practice and so policy has tended to focus on the more easily achievable recycling targets for household use. Research has shown that relationships to second-hand goods are complex and do not follow new product consumption patterns (Gregson et al. 2002) with particular sets of knowledge required to evaluate the products.

Moreover, Bulkeley and Gregson (2009) have suggested that too often policy has attempted to install programmes which do not consider the non-linear nature of household waste practices. They suggest that better policy would consider working with partners and “rather than imposing practices on households [adopting] policy interventions [that] can take their cues from what is already going on” (p943). In

working with CRNS to create the Revolve programme, ZW Scotland built on the expertise of the already successful parts of the reuse sector in Scotland. Another area in which ZW Scotland appears to be building on the knowledge of contextualised experts is in its ZW Scotland Volunteer Programme

ZW Scotland Volunteer Programme

Like the Revolve standard, the ZW Scotland Volunteer Programme (ZWSVP) was not discussed in the ZW Plan nor does it appear in any published policy documents. On the other hand, for those interviewees who chose to discuss volunteers, the grassroots element of the ZW programme was an important component, if albeit ideologically so. The interviewees were keen to highlight the number (hundreds) of volunteers involved in ZW schemes in Scotland.

The ZWSVP was announced in July 2011, with the creation of 20 volunteer schemes operating across Scotland to encourage ZW activities (ZW Scotland, 2011b). Initially focused on 4 projects: Love Food, Hate Waste (food waste campaign), Home Composting, ‘Stop the Drop’ (anti-junk mail campaign) and better recycling practices, the scheme funded coordinators to “recruit, train and manage a local network of volunteers to support delivery of local and national recycling and waste prevention campaigns” (ZW Scotland, 2011c:8). Coordinators run campaigns appropriate to their local area including information distribution; stalls at fairs and public events; publicity campaigns and workshop coordination. ZWSVP has developed in the past 2 years to extend campaigns beyond the four initial projects, with emphasis now placed on local area issues related to ZW.

Numerous academic studies highlight the importance of multiple stakeholder involvement to achieve ZW and sustainable waste management policies with Lehmann (2011:174) suggesting that ZW needs a combined effort of communities, researchers, industry and government bodies. Equally education is widely suggested to be an integral part to achieving ZW goals (i.e. Lehmann, 2011, Zaman, 2014a). Again the work of Bulkeley and Gregson (2009) would suggest that these goals should be combined (and too readily are not) with a focus placed on the practices of waste disposal at household level and education programmes developed accordingly. By

contextualising and yet coordinating its approach, it would appear that the ZWSVP aims to do this.

Earlier in this thesis it was noted that in many places ZW has been associated with the global grassroots movement of the ZW Alliance (see p40). Despite the inherently grassroots nature of the ZWSVP, this has not been the case in Scotland. ZWSVP represent a diverse group of bodies; some groups are coordinated by existing social enterprises (i.e. Changeworks), others by groups linked more closely to the Transition Network (i.e. Transition Towne Forres), others are run by local authorities (i.e. Perth). In their review of a similar scheme in England, Phillips et al. (2011) suggested that uptake in the scheme would improve if it was consolidated alongside existing schemes run by the Transition Network and local authorities who are already familiar with engaging with communities.

The ZWSVP represents an effort to educate the public on household waste management, however, the role of the general public engaging in policy shaping was less apparent. The literature has noted that civil society have often been excluded from waste governance discussions (Davies, 2008; Bulkeley and Gregson, 2009). Non-governmental actors were seen as important by interviewees; however, they tended to focus on the lack of engagement with business with the policy. ZW Scotland has endeavoured to address this by creation of the programme of Resource Efficient Scotland.

Resource Efficient Scotland

Initiated in 2013, Resource Efficient Scotland (RES) is the programme designed and developed to talk ZW to businesses. The importance of involving the private sector has been always an obvious feature of the ZW policy; on announcing the ZW policy Richard Lochhead unequivocally stated:

“individuals can only do so much. Businesses must also give greater consideration to the impact of their actions and I want to see a much bigger focus on reducing commercial and industrial waste” (Scottish Government, 2008a).

The ZW Think Tank had a subgroup on business efficiency who highlighted the importance of knowledge transfer; bottom-line costs and common standards as key to promoting ZW ideas within business (ZW Think Tank, 2010d). One of the ZW Think Tank key recommendations for ZW action was to ensure that “business should strengthen their efforts to become more resource efficient” (ZW Think Tank, 2008d). The ZW Plan included many references to enhanced resource efficiency including better data, more sector focused efficiency programmes and encouragement of waste reduction under its “Resource Stream” theme (Scottish Government, 2010a:5).

RES was created as part of a consortium to provide information to all of Scottish business on efficiency in multiple resources including water, waste and energy. The rhetoric used is savings (financial and material) and focus is placed on reducing costs to the bottom line. RES describes itself as: “the free advice and support programme designed to help you save money and reduce energy, water and waste” (RES, N.D.). It provides advice, workshops, tools and knowledge exchange networks in a one stop shop for private and public organisations. Many interviewees noted the importance of speaking a language that businesses understands in order to have them engage with the ZW agenda.

Six months after the creation of RES, the Scottish Government published its *Safeguarding Scotland’s Resources: A Blueprint for the Circular Economy* (Scottish Government, 2013) , within which RES was described as the “centrepiece” to the policy (p3). Importantly *Safeguarding Scotland’s Resources* makes it clear that resource efficiency is not the only goal of the policy but the initial step in the “deep shift” towards circulisation of Scotland’s economy (p6). Equally important is the separation between the ZW policy and *Safeguarding Scotland’s Resources*, with the latter clearly identified as part of the ZW agenda. The separation of RES from the other activities of ZW Scotland potentially allows the investigation of ideas that might otherwise be unpalatable to mainstream business whilst the efficiency focus of RES allows a gateway into further partnership with businesses.

Clay et al. (2007:786) found in their study of Victoria, Australia that encouraging sustainable consumption and production was “not primarily about improving efficiencies” but also required fostering of relationship, development of partnerships

and helping businesses appreciate the benefits of cleaner production. By speaking the language of business, RES is engaging with organisations that might otherwise ignore the work of ZW Scotland. Moreover on a long- term perspective, it has been suggested that it is important to shift business mind-set from seeing waste as a problem, to waste as a resource. Greyson (2007) suggests that to do this we move from addressing the impacts of waste to preventing waste in the first place, an idea that is in line with the purposes of RES.

Preceding the creation of the ZW policy one of the most discussed issues in Scottish waste management is complexity of regulations (SEPA, 2008). Businesses are seen as requiring assistance to encourage them to adopt resource efficient practices but are reluctant to have further or more complicated legal requirements imposed. Many of the interviewees highlighted this issue and most thought there was a need for better (i.e. more efficient) rather than more regulations. Such is the political context, any engagement with business through the ZW policy somewhat inevitably would have to be undertaken on a voluntary basis. Nevertheless legislation does continue to play a role in ZW Policy.

5.3.4 Legislation

EU directives have played a key role in the development of the ZW policy and waste has been traditionally heavily regulated in Scotland (Reid, 1997). Legislation has been included as part of the ZW Policy, but at the time of data collection was yet to be in force. As a consequence, whilst a number of interviewees made reference to the Waste (Scotland) Regulations 2012, their impact was not yet known.

The Waste (Scotland) Regulations 2012 were designed to encourage the separation of food waste by business and organisations, reduce the biodegradable waste going to landfill and to ensure that materials collected for recycling did not go to landfill (See Box 5.5 p167). In brief, the legislation was designed to increase the quality of recyclate by removal of contaminating food waste; provide assurance that recycling was worthwhile and to meet the EU requirements to separate biodegradable waste from landfill (Waste Framework Directive 2008/98/EC).

Most interviewees were behind the new regulations, although they noted that few outside of the waste industry appeared aware of their existence. It was thought that few businesses were preparing for their new responsibilities and one of the tasks for ZW Scotland was to disseminate information on the new requirements. Despite the general welcoming consensus of the new regulations, discussion was always held against the backdrop of the requirements for improved waste regulation. A programme begun by SEPA in 2008, 'Better Waste Regulation' was designed to address the complaints surrounding the complexity, ambiguity and barriers of existing waste regulation. The latter was deemed particularly important by interviewees to encourage more collaborative use of recycled resources. Few interviewees thought that more regulation for waste was necessary, but they did think that a revision and overhaul of current legislation was required.

Literature on waste law is too expansive to cover in any meaningful detail for this thesis. In contrast, the role of legislation has not been explored within a ZW Policy context. Writing about the Scottish ZW Plan, Tainsh (2011) debates whether the ZW Plan is compatible with other statutory requirements of low-carbon targets. She surmises that the ZW Plan effectively enforces a limit on the use of energy from waste which she argues could prevent Scotland reaching its emission targets outlined in the Climate Change (Scotland) Act 2009 by acting as a disincentive to infrastructure development.

Box 5.5: Waste (Scotland) Regulations 2012: Key Developments

- All businesses and organisations to present key recyclable material for collection from 1 January 2014
- Food waste businesses producing over 50kg of food waste per week to present it for separate collection from 1 January 2014
- Food waste businesses producing over 5kg of food waste per week to present it for separate collection from 1 January 2016
- A ban on the use of macerators to discharge food waste into the public sewer from 1 January 2016
- Local authorities to provide a basic recycling service to all households by 1 January 2014
- Local authorities to offer a food waste recycling service in non-rural areas from 1 January 2016
- A ban on material collected for recycling going to landfill or incineration
- A ban on municipal biodegradable waste going to landfill by 1 January 2021

(ZW Scotland: ND)

Since 2014, Scotland has introduced further regulations in line with the ZW Plan, most notably the Carrier Bag Charge (Scotland) Regulations 2014. Legislation appears to be playing a role within the ZW Policy but it is an intervention that has only recently been deployed, as a consequence, the impacts are yet to be seen. In contrast, funding through grants and loans have been utilised since the very beginning of the ZW policy.

5.3.5 Funding

One of the first actions of the ZW policy was the introduction of specific funds to encourage investment in plastic reprocessing facilities. In their summary report, the ZW Think Tank advised that the Scottish Government should encourage development of plastic reprocessing (ZW Think Tank 2010b:1) and in March 2009, the Scottish Government announced a £5million grant fund to cover up to 30% of investment in new plastic reprocessing facilities. The goals were both increased plastic recycling rates and the circularisation of plastic use in Scotland (WRAP, 2009). The importance of plastics reprocessing was highlighted by its inclusion in the ZW Plan where it was made clear that the Scottish Government “will continue to support the development of collection and reprocessing capacity for plastics” (Scottish Government, 2010a:8).

This funding was supplemented by additional resources from ZW Scotland for innovation projects and research. No documents in this project discuss these funds and whilst a number of interviewees noted their existence, few discussed them in any depth. One interviewee proposed that the grants and tenders available suggested a lack of focus and a long list of current and past projects can be seen on the ZW Scotland website. The number, variety and constant change of advertisements meant that analysis and repercussion of these tenders and grants went beyond the scope of this thesis, so this section will continue to focus on the more visible plastics reprocessing fund.

The ZW Scotland report, published in early 2012 considering the *Evidence Base for Plastics Reprocessing in Scotland* (ZW Scotland, 2012a), suggested that the “capacity of managing collected waste plastics in Scotland is limited” (p3) but that there was economic value in promoting plastics recycling in Scotland. This was taken forward with the creation of the Scottish Plastics Loan Fund. This £2.5 million joint project between ZW Scotland and Scottish Enterprise offered loans to encourage investment in recycling and reprocessing of plastics (ZW Scotland, 2012b). This fund was increased to £3.8 million in 2013 (Scottish Government, 2013).

A number of interviewees made reference to the plastic reprocessing fund and the potential opportunities that Scotland could gain from focusing its efforts on one particular resource stream. It was suggested that reprocessing was currently limited for two reasons i) a lack of infrastructure for reprocessing in Scotland and ii) the lower cost of recycling elsewhere. Some interviewees believed that recycling commodities analysis suggested that Scotland could gain the best competitive advantage by focusing efforts on quality reprocessing of high value plastic.

The idea of encouraging development in specific national sectors is, of course, not new; however, it would seem that the goal of developing a competitive advantage in reprocessed resources is a fresh approach to economic development in Scotland. The importance given to plastic reprocessing suggests a shift in resource management approach from focus on Scotland’s natural assets to a more strategic assessment of Scotland’s resources which links to the kind of material flow analysis encouraged in ecological economics. This idea is furthered in the *Raw Materials Critical to the*

Scottish Economy report (SNIFFER, 2011) which highlighted 17 key resources in Scotland's economy. Importantly these resources were often imports (i.e. palm oil, rare earth metals and indium) and the report concluded that the Scottish Government required to take a "more strategic approach to resource use" (p86) both by "securing access to raw materials" and promoting a more closed-loop economy (p83). Plastics are not considered in the report, nevertheless, the focus on developing expertise in this type of commodity does speak to a wider conceptualisation of Scotland's potential assets.

The use of material flow analysis (MFA) as central to ZW policy has been noted (Lehmann, 2011; Zaman and Lehmann, 2011; 2013). Zaman and Lehmann (2013) suggest that material flow analysis can form the basis for a ZW index to evaluate ZW performance of cities. They suggest that MFA can be used to identify opportunities to circularise the "linear metabolism" of cities and offer opportunities for ZW interventions (p124). Earlier work by the pair (Zaman and Lehmann, 2011) highlights potential interventions based on this type of analysis, notably these do not include an economic evaluation of existing reprocessing and recovery procedures in competitive cities. On a national scale, Geng and Doberstein's (2008) comprehensive review of policy action taken to forward the idea of the circular economy in China also does not consider the idea of developing a national competitive advantage in a particular resource stream. This suggests that this policy action is either unique to Scotland, or more likely, a yet unidentified as a feature of ZW policies.

5.3.6 Summary Responses to Research Question

This section sought to understand how ZW is implemented as policy in Scotland. Emphasis was placed upon key policy interventions. The common theme across all discussions was that the ZW policy presents an inclusive but flexible approach to implementation, adopting both the content and process advocated by the academic literature as being compatible with sustainable waste management programmes.

It was suggested that the ZW Plan presented a markedly different strategy from the earlier national waste policy, the 2003 Plan, in that the ZW Plan was more accessible and less concerned with actions than visions. It was contended that this could be the result of the wider stakeholder consultation which created the plan. It was also suggested that

ZW Plan is in line with academic literature on sustainable waste strategy. The same could also be said of the Revolve reuse standard and RES which appeared to adopt the academic suggestion that these programmes should be developed alongside and using the language of interested stakeholders.

Legislation was found to have less of a visible role in the policy, in contrast to past waste management techniques. Similarly the policy has sought to include sectors (reuse) and scales (households) that academic literature has suggested is often excluded from policy making. It was suggested that the boundary role of ZW Scotland was central in overcoming the structures which have previous limited waste management policy in Scotland.

In response to the research question: how is the policy goal of ZW *pursued* in Scotland? It was found that various interventions were implemented as part of the policy. These came in a number of forms including policy documents; instruments; initiatives; legislation and funding. Some of these interventions were deemed particularly innovative, including the creation of the boundary organisation ZW Scotland, funding of specific resource streams, engagement with volunteer groups and a national label for reuse quality. Each of these interventions speak to a new form of governance which is more inclusive and takes on a broader perspective of the remit of waste management.

5.4 Conclusion

This chapter has attempted to provide insight into the empirical study of the ZW policy in Scotland which was intended to be an exploratory study of the manifestation of ZW at a national policy level. The chapter aimed to develop an understanding of ZW governance in Scotland by considering 2 research questions.

- 1) How is the policy goal of ZW *understood* in Scotland?
- 2) How is the policy goal of ZW *pursued* in Scotland?

It was found that ZW policy in Scotland has developed and is implemented in ways that complement much of the existing academic literature on sustainable waste governance and ZW waste. However, limitations of current academic knowledge and the potential for discussion in this thesis were also identified and it was found that certain aspects of

the ZW policy in Scotland make it an ideal case study for future empirical research (see Box 5.6 p124).

Box 5.6 Areas for Further Investigation in Zero Waste Governance

- Role of non-governmental agencies in promoting ZW
- The potential for labelling to promote reuse on a national scale
- ZW as a lens to understand other policies
- Understandings of ZW across stakeholders
- Views on ZW outside the policy arena
- The implications of national specialities in reprocessing
- Role of organisational structure in promoting ZW at a voluntary level

This research contributed to the literature by finding that the concept of ZW at a national policy level was seen to be multifaceted and more visionary than has been suggested in other empirical ZW studies. It was argued that this has expanded the scope of waste governance in Scotland, with the data suggesting that ideal ZW governance should include all stakeholders, consider all stages in the production process and cross policy. This points to the conclusion that ZW policy is a move towards understanding waste as a resource.

This chapter also considered the actions being taken under the policy and it was suggested that this reimagining of waste was reflected in many of the policy interventions. It was found that policy included more stakeholders and was more flexible than previous waste policies. The development of ZW Scotland as a boundary organisation to facilitate understanding of waste and expand the scope as envisaged by the policy was also an innovative creation. It was suggested that these policy interventions reflect not only ideas identified within sustainable waste governance literature but have additionally, sought to address some of the problems attributed to waste governance.

Overall it could be contended that these policy interventions mark a shift from a waste management policy based on outcomes to a process-focused waste governance. This suggests that the policy marks a change, not only in the conceptualisation of waste to resource, but also in the governance techniques required to achieve this aim. The literature would suggest that this is a shift towards a more sustainable waste governance. This leads to the question of whether the rationale behind waste

governance has also changed and whether this development can be linked to a governmentality for sustainable development. This will be explored in the next chapter.

6 Constructing A Governmentality of ZW in Scotland

6.1 Introduction

The previous chapter presented the objectives of the ZW policy and the techniques employed to reach those goals. It was argued that both objectives and actions represent a change for waste governance in Scotland which suggests a shift in understanding of waste as a problem for disposal, to a resource to be managed. Building on this empirical understanding, this chapter considers the data through a theoretical lens. It uses the concept of governmentality to shed light on the rationale behind the ZW policy. This rationale is then considered against sustainable development governmentality in an effort to address the second aim of this thesis: *to critically assess the governmentality of the ZW policy in Scotland in relation to sustainable development governmentality*

To achieve this aim, the chapter considers two research questions:

- 1) What is the rationale behind the implementation of ZW policy in Scotland?
- 2) How does the rationale of ZW governance compare with sustainable development governmentality?

The first question is addressed in two ways, both using the framework established by Gouldson and Bebbington's (2007) interpretation of Dean (1999) which formed the basis for the Framework for Analysis in this thesis. First, analysis compares previously identified aspects of existing Ecogovernmentalities with the findings from this research project. Discussion centres around four Ecogovernmentalities identified in the literature review: Green Governmentality, Ecological Modernisation, Civic Environmentalism and Global Governmentality. Second, the analysis is opened up beyond existing constructions of Ecogovernmentality and, using the idea of Environmentality, discussion centres on the more unique features of ZW policy. It was found that, despite ZW having been presented as a new rationale for governance of waste in Scotland, and this rationale offering critical evaluation of existing practices, the identification and innovation of alternative governance techniques was limited.

The second part of the chapter synthesises the discussions from the first research question in relation to the literature on Governmentality for SD. It is suggested that

there is alignment between the Governmentality for SD proposed by Frame and Bebbington (2012) and the identified governmentality in this thesis. However, it was found that the alignment occurred with the pragmatic aspects of Governmentality for SD and that elements that linked to the normative and value elements of Governmentality for SD were lacking. From this perspective this thesis suggests that the promotion of “strong transdisciplinarity” (Max-Neef, 2005) may enhance the alignment between Governmentality for SD and ZW governance.

6.2 Ecogovernmentalities in ZW Policy

In Chapter 3 it was stated that Ecogovernmentalities represent the attempts to describe the shift in governmentality that occurs when environmental issues problematise the act of governing. It was argued that this shift has been described in various ways. Green Governmentality and Ecological Modernisation were given as examples of advanced-liberal governmentalities of the environment. These are the most visible Ecogovernmentalities in the literature. However, in recognition of the critiques that suggest governmentality studies too readily rely on neoliberal explanations for governance practices, it was acknowledged that other constructions of the rationale behind environmental governance choices, also exist. As a consequence discussion of Ecogovernmentalities was extended to include Civic Environmentalism and Global Governmentality.

6.2.1 Green Governmentality

This thesis takes the conceptualisation of Green Governmentality as “the manifestation of biopower in the environmental field” (Oels, 2005:194). Using Oel’s construction of biopower, this can be taken to mean a governmentality where the actions of individuals within a population are controlled by disciplinary means. These can include self-discipline, where the government encourages individuals to adopt state promoted codes of conduct through comparisons of behaviour, and more explicit disciplinary techniques including regulatory controls. Within a Green Governmentality framing Oels (2005:195) terms these “enviro-disciplines”, which she suggests focuses on individual environmental behaviour and global environmental limits.

Luke (1999) claims that these visibilities are a result of Geopower, a form of rationality that labels environmental harm as socially immoral behaviour. The limits of this behaviour are established through forms of eco-knowledge which include environmental science which seeks to set out the ecological boundaries of the Earth and the transposition of this knowledge to limits for individual actions.

There are clearly elements of this characterisation of governance rationale evident in the ZW policy and with the traditional state-controlled nature of waste management this might be expected. One of the key problematisations identified as driving the policy was the requirement for more sustainable resource management within Scotland. The ZW policy presents resources as limited and so encourages the use of disciplines which help explain these constraints (i.e. ecology and economics). The specific focus on Scottish resources, present in much of the policy, also supports Luke's view (1999) that resource limits are often framed as issue of national security, linked to a specific state or population.

Scotland as a field of visibility is a clear feature of much of the discussions within this project's data. Similarly many of the techniques used, including waste regulations and recycling targets suggest that the goal of government is to direct the behaviour of the population towards certain forms of resource use. Much of the knowledge used in promoting these goals is based on ecological consequences, resource limits and predicted growth in population. This speaks loudly to the 'enviro-disciplines' identified by Oels (2005) and the ecological science knowledge which Russell and Thomson (2009) link to biopower governmentality. Whilst much of the knowledge underpinning these regulations and statistics is very technical, descriptions have been largely translated into every day terminology (i.e. packaging, waste electronics, vehicles, textiles, paper) suggesting that the focus of the policy is the general population: a group who are often perceived to have a poor technical knowledge of waste.

Box 6.1: Elements of Green Governmentality Identifiable in Scotland's ZW Policy

	Green Governmentality	Scottish Zero Waste Policy
Problematisation	Failure of government to protect citizens from environmental problems	Failure of government in the management of natural resources
Visibilities	Population, Earth as a system of finite resources	Key resources, Scotland, climate change
Techniques	Regulations, statistical norms, benchmarks and limits, environmental management, systems modelling	Waste regulations, policy targets, waste licences, EIA
Knowledge	Natural science, environmental science	Recycling rates; resource quantities; carbon emissions; population rates
Identities	Individual subjects of particular states, humankind	All stakeholders in Scotland (individuals, business, local authorities)
Utopia	Individuals operating within the ecological limits of the Earth	Closing the loop on resource use (as much as possible within Scotland)

(Green Governmentality characterisations adapted from Russell and Thomson, 2009 ; Oels, 2005; Luke, 1999)

On the other hand, other studies suggest that Green Governmentality focuses on “big science” (Bäckstrand and Lövbrand, 2006:54), “populations” (Russell and Thomson, 2009) and “global scientific assessments” (Oels, 2005) to justify behaviour controls. This is less apparent in the ZW policy, where focus on material flow and resource use continues to be centred on Scotland. Comparisons are made with other (mainly Northern European) countries on certain indicators (i.e. recycling rates and waste arisings) but specific data on key resources is very nation state focused. This could be explained by the lack of clear data on waste on a global scale. There are no waste ‘disciplines’ and universal terms are broadly defined which makes it more difficult to evaluate on a planetary scale. Equally whilst other studies have suggested that technical knowledge of experts often results in a global governing elite (Bäckstrand and Lövbrand, 2006:54), this is also less apparent in the ZW policy where the materiality and everyday ubiquity of waste enhances the importance of contextualised knowledge. For example whilst there were complaints about the multitude of collection systems

within Scotland from the interviewees, there is still a recognition that local authorities have a key role to play in the interpretation and implementation of ZW policy in Scotland in that they are best placed to respond to geographic and demographic particularities.

The consequences of materiality of waste on governance rationale have been noted elsewhere. In their 2007 paper on modes of governing municipal waste, Bulkeley et al. found that the mode ‘diversion’ was the most dominant way of dealing with municipal waste in Northern England. Many of the manifestations of that mode including, its hierarchal nature, and “the use of performance targets” (p2740) encapsulate how a Green Governmentality representation of ZW policy might look. However, Bulkeley et al. (2007) note that the ambition to ‘govern at a distance’ is limited in this mode by the particularities and complications of waste in a given locale. This, they suggest, encourages the development of alternative modes of waste management including “eco-efficiency” and “waste as a resource” (p2749). They argue that eco-efficiency mode of governing has promoted the value of waste, particularly in the waste hierarchy.

This is not something that becomes apparent from Green Governmentality consideration of the ZW policy, however, this speaks to previously identified limitations of this theory which suggest it fails to capture the economic aspects of environmental governance rationale (Oels, 2005). This has, in part, contributed to the development of Ecological Modernisation as an alternative explanation of the advanced-liberal governmentality behind environmental governance practices.

6.2.2 Ecological Modernisation

In contrast to Green Governmentality which links closely to biopower as its explanation for environmental governance rationale, Ecological Modernisation (EM) is more readily associated with the advanced-liberal goal of ‘governance at a distance’. Oels (2005: 198) suggests that Ecological Modernisation manifests in climate policy by “highlight[ing] the economic costs of taking action on climate change”. A similar discussion can be identified in the ZW policy where one of the most apparent problematisations identified was that of economic development (see Box 6.2 p178).

Box 6.2: Elements of Ecological Modernization Identifiable in Scotland's ZW Policy

	Ecological Modernisation	Scottish Zero Waste Policy
Problematisation	Failure of the State to adequately govern the environment	Lack of economic development in Scottish resource sector
Visibilities	New markets, businesses, ecosystem services	Key resources, Required Infrastructure
Techniques	Markets; performance benchmarks; voluntary agreements; collaborative spaces; technological development	Identification of key resources, collection, grants and loans, knowledge transfer networks, smarter regulation
Knowledge	Neo-liberal economics	Material flow, resource efficiency
Identities	Individual economic actors	Funders, businesses
Utopia	Free markets which encourage environmental behaviour without the influence of the state	Maximising the value of resource use in Scotland

(Ecological Modernisation characterisation adapted from Russell and Thomson, 2009 ;
Oels, 2005;)

The ZW policy appears, in part, to be a response to the failure of the previous waste policy to encourage investment in the resource sector in Scotland. Some of the key visibilities and techniques which emerged through the data were linked closely to particularly high value resource streams; for example The Plastic Reprocessing Fund (see p167 for further discussion). The focus on high value resources was also apparent through the importance given to the knowledge (or lack of current knowledge) of material flows. Importantly, emphasis on material flows and high value resource streams was nearly always linked to those resources from which Scotland could benefit from an economic advantage. Moreover many of the techniques identified as being central to the ZW policy in Chapter 5 can be seen as methods of governance designed to maximise market information and economic efficiency. The financial techniques of landfill taxes and fines that form part of Scotland's waste regime are clearly designed to encourage a specific form of economic development but agenda setting, support and advice all have elements which link to Ecological Modernisation.

The agenda set by the ZW policy appears to be one designed to maximise economic development. Through Annex B of the ZW Plan, the Scottish Government has also tried to communicate to business the infrastructure requirements for a ZW Scotland to reduce uncertainty about future policy direction and to stimulate capital investment in resource management. Agenda setting is a technique associated with EM governmentalities. Empirical studies of climate change have suggested that EM techniques can be identified through techniques like the Kyoto Protocol which sets benchmarks for carbon reduction but allows individual freedom in how to achieve those goals (Bäckstrand and Lövbrand 2006 and Oels, 2005). A similar approach can be seen in waste at a regional level where the EU Waste Directives set targets but leave implementation of policy to nation states and at a national level where the Scottish Government has set ZW targets but left a degree of freedom for individual local authorities to interpret the policy.

The support and advice offered by ZW Scotland links closely to micro-level economic efficiency. Businesses and households are given guidance to maximise their own resource use, often under the rhetoric of saving money. The business link of ZW Scotland, Resource Efficient Scotland, is a clear example of both the importance given to self-regulation of business practices but also the inclusion of business in environmental governance. Oels (2005:199) states that the type of advanced-liberal governmentality of EM “mobilises actors in the business sector” to “contribute in their own way” to climate governance which makes this a “matter of concern” for these entities. This is clearly a goal for RES in relation to waste and resource use. The organisation offers advice but also tools to understand and draw the attention of businesses to their waste practices.

In many ways it is difficult to differentiate this kind of ‘home economic’ self-discipline as an element of Ecological Modernisation or Green Governmentality. The similarities between these theories of governmentality have been noted elsewhere (Bäckstrand and Lövbrand, 2006; Oels, 2005) and to a certain extent it has to be recognised that the separate constructions have been developed for academic purpose to explain different manifestations of advanced-liberal governmentalities in environmental governance. It might be more accurate to consider the elements of Green Governmentality and Ecological Modernisation as representations of a broader liberal environmental governmentality, for it has been noted that within these two constructions, there is a

spectrum of manifestations of biopower and marketisation (Bäckstrand and Lövbrand, 2006). An argument that is echoed by other studies of neoliberal governmentalities (Keskitalo et al. 2012).

As arguably the dominant rationale behind recent governance policies it is perhaps unsurprising that both Green Governmentality and Ecological Modernisation can be used to explain some of the empirical findings in this research project. However, it has been suggested, both in this thesis and elsewhere (Agrawal, 2005a; Dowling, 2010), that empirical governmentality studies are sometimes too ready to associate governance practices with advanced-liberal governmentalities. The theories of Green Governmentality and Ecological Modernisation explain some of the practices of governance apparent in the ZW policy but are not thought to accurately represent the policy as a whole. Discard and waste studies suggest that when something is labelled as important it becomes more visible and, as a consequence, we tend to ignore that which is unlabelled. This consideration also forms part of the governmentality framework in this thesis. There is reason to suggest that part of the explanation for the obvious appearance of advanced-liberal elements of governmentality is that these are the constructions that have been most developed in the literature and so are most easily identifiable.

It is possible to link the findings of Chapter 5 of this thesis with advanced-liberal explanations but equally some of the findings are left unexplained. It is suggested in this thesis that insight into some of these unexplained aspects could be found by applying an alternative governmentality lens. A number of different sources have suggested that multiple governmentalities can be identified within one policy setting. To illustrate this point two further governmentalities will be reviewed.

6.2.3 Civic Environmentalism

Civic Environmentalism emerged from the idea that governance from the state has failed to address environmental problems and so it looks to civil society for bottom-up solutions. Bäckstrand and Lövbrand (2006) conceptualise this theory in two ways: *reform* Civic Environmentalism and *radical* Civic Environmentalism. The former seeks to use stakeholder participation to reshape existing institutions and public policy whilst

the latter offers a radical critique of the current governance system. Bäckstrand and Lövbrand (2006) considered Civic Environmentalism in relation to international climate change politics, however existing waste governance literature also suggests that alternative perspectives often come from the bottom up (Davies, 2008).

The first observation from the data is that ZW policy speaks more to *reform* Civic Environmentalism (see Box 6.3 p182). The importance of stakeholder participation is clear within the ZW policy, with a heavy focus on consultations, conferences and networks which bring a broad spectrum of voices together to discuss the ZW policy. These collaborative techniques are seen as an opportunity to bring more expert knowledge to the table particularly surrounding local engagement and need for services. Bäckstrand and Lövbrand (2006:9) identified this bottom-up approach to policy-making as central for “empowerment and capacity building” with a normative justification for increased participation in governance. This was less apparent in the ZW policy where the consultation with multiple stakeholders appeared to be less about giving participants a voice than creating a practical and implementable policy for waste. Moreover, whilst the place of community and social enterprise groups in the reuse sector was highlighted as important, this was based on the ability of these groups to provide a service rather than a moral imperative to include all sectors of society within waste management provisions. This links to the research of Summerville et al. (2008) who argue that community participation, although central to a number of SD policies, often manifests as a means to an end; an idea which speaks to the centralised encouragement of community action as an extension of governance at a distance.

Box 6.3: Elements of Civic Environmentalism Identifiable in Scotland's ZW policy

	Civic Environmentalism	Scottish Zero Waste Policy
Problematisation	The failure of government to promote alternative environmental visions	The failure of society to reduce waste
Visibilities	Local groups; non-state actors; public assemblies, global North/ Global South	Schools; community organisations, reuse and repair centres
Techniques	Reform: participation, cooperation, voluntary agreements Radical: resistance of global agreements and institutions	Quality assurance labels; consultations; networks, reuse services, voluntary groups
Knowledge	Critical thought; specialised expertise; local knowledge	Local knowledge, alternative lifestyle practices
Identities	Marginalised groups, NGOs, businesses, research community	Community groups, social enterprises, schools, active citizens
Utopia	Reform: collaboration amongst stakeholders to problem-solve environmental issues Radical: Transformation of consumption patterns and institutional structures	Active use of Scotland's Reuse Sector

(Civic Environmentalism characterisation adapted from Bäckstrand and Lövbrand, 2006)

Moreover whilst Bäckstrand and Lövbrand (2006:9) suggest that the role of “alternative” actors in Civic Environmentalism can present an alternative to traditional ideas of economic development, this is not clear within ZW policy. It was identified that community groups provided a service where a liberal market and government policy had failed i.e. the reuse sector. On the other hand, it has been noted that community groups are becoming more social entrepreneurial and measurements of success of the industry remain economic in many instances, with the social benefits largely ignored. Additional support has been given to community groups through the Revolve reuse labelling programme (see p160) for reuse and repair - highlighting the cooperation between government and community organisations, rather than seeing these groups as a conduit for radical alternatives to existing consumption policies.

McKee (2008) witnessed a similar finding in her work on social housing where she found that community involvement, though encouraged, was often limited by other more centralised government policies – particularly in providing “political resistance” (p190). This led her to conclude that although “the state may no longer have all the answers to solving society’s problems... it nonetheless continued to have a pivotal and central role in shaping both the conceptualisation of the problem and the proposed solution” (p 195).

Further supporting this finding, there was no clear critical voice identified in waste policy in Scotland. It was not clear what role NGOs, the media or any critical voices played in shaping ZW policy. Equally, beyond individual interviewees there was no apparent considerations the juxtaposition of consumer culture and reduction in waste and certainly there was no policy document discussion of this sort. In their study Bäckstrand and Lövbrand (2006) highlight that critical voice in climate discourse emanates most strongly from academic circles. There is a perceived lack of engagement between academia and the waste sector in Scotland, which might explain the absence of elements which exhibit more *radical* Civic Environmentalism.

On the other hand, some of the ZW literature reviewed in Chapter 2 of this thesis suggests that the term ZW encapsulates a goal which inherently encourages an alternative way of thinking about resource use. Goldmann (2001) suggests that a Global Governmentality, where voices grassroots voices come together to speak as one, can challenge existing more state oriented governmentalities. To the extent that ZW is an international movement, it makes sense to consider the ZW policy in respect of Global Governmentality to try to further understand the rationale behind the policy.

6.2.4 Global Governmentality

For Methmann (2011:11), Global governmentality manifests as the “carbonification” and “marketization” of international climate change governance. He suggests that through the Clean Development Mechanism (CDM) climate governance enhances ‘governance at a distance’ and superimposes the idea that climate governance through carbon accounting is not a political idea but rather one based on systemic knowledge of the carbon system. In this sense it could be described as business as usual with a carbon

twist. Methmann's conceptualisation speaks to how the ZW policy was considered at an international scale in the data in this study (see Box 6.4 p184) .

Contrary to what the reviewed literature on Ecogovernmentalities might predict (i.e. Goldman, 2001), ZW policy did not present through this data as part of a global ground swell to question consumption practices; rather the early references to ZW in the Scottish policy were as a more global movement linked with the idea as micro-economic efficiency within business, instead of a critique of the production-consumption process.

Box 6.4: Elements of Global Governmentality Identifiable in Scotland's ZW policy

	Global Governmentality	Scottish Zero Waste Policy
Problematisation	Climate Change is a global problem which transcends state borders	Sustainable resource use is a global problem
Visibilities	Climate change, transnational actors, the planet, carbon cycle, carbon emitting behaviour	Production consumption cycle
Techniques	Carbon market, international trading regimes, carbon offsets, technical studies	Material studies, recycle markets, alternative business models, changing narratives
Knowledge	Carbon accounting, economics, not social developments	Lifecycle analysis, material flow, economics
Identities	Market participants, carbon emitters, leaders (heads of state)	Market participants, producers, leaders (business)
Utopia	Carbon Neutral Economy	Circular Economy

(Global Governmentality Definition adapted from Methmann, 2011)

In contrast, in the discussion of a circular economy type scenario where focus was placed upon material flow and life-cycle analysis would allow considered choices to be made on an international scale about sustainable production and consumption techniques. This mirrors the carbonification of the market Methmann (2011) identifies. He states that carbon governmentality "is based on the assumption that we can gather enough solid knowledge about natural and social processes that it is possible to predict

their future on a planetary scale” (p13). The roles of measuring and monitoring these futures are placed at the hands of experts using complicated computer prediction technology. Resource management can offer a similar approach. For some interviewees, waste was seen as an inefficiency which is often seen as a consequence of a lack of good data rather than a fundamental issue with the underlying economic rationale. In the same way that CDM seeks to provide a structure through which predictions about climate behaviour and subsequent governance decisions can be made, the circular economy allows for the continuation of the policy of economic growth but attempts to reduce the unwanted consequences of waste.

Methmann (2011) suggests that Global Governmentality does not impose this idea through institutions or state governments but instead uses knowledge and expertise to depoliticise carbon markets where they become an inevitable feature of the modern political landscape. This is also seen through the circular economy in ZW policy where producers and forward thinking companies are encouraged to promote new business models which offer alternative, less resource demanding forms of consumption. This is, perhaps most readily identified in attempts to change the narrative around waste, where discards are seen as valuable resources. Like carbon governmentality seeks to render climate change politically neutral, so has the ZW with waste by converting it to valuable resources for use in the circular economy.

It was difficult to identify a united dissent in response to the circular economy and its goals of reducing waste and maximising economic value were readily identified as making common sense. Recent academic work on the circular economy also responds positively to the idea’s “socially transformational” qualities (Hobson, 2015:12) and it has been reported as a positive development in production-consumption policies in Europe (Gregson et al. 2015). However, it has also been noted that more socio-political analyses of the circular economy are needed to further unpack how the idea emerges in different empirical contexts (Hobson, 2015).

6.2.5 The Limitations of Ecogovernmentalities

There was a strong indication of the influence of advance liberal governmentality identified within the ZW policy, however, other governmentality were also found to

give insight into the rationale behind waste governance practices in Scotland. It would be too simplistic to conclude that advanced-liberalism explains the rationale behind the ZW policy. This 'spectrum' of theories on governmentality do offer some representation of the ZW policy, but, as Russell and Thomson (2009:242) found in their evaluation of the Scottish SD strategy, some of these advanced-liberal explanations can also be attributed to "legacies of past government programmes". For example, some of the measures and targets in ZW are longstanding in Scottish waste policy. Similarly processes – such as local authority responsibility for municipal waste – make the collection of this data more straightforward.

Bulkeley et al. (2007) identified that modes of governance of waste of disposal and diversion (the primary means of dealing with waste in Scotland prior to the ZW policy) were linked to technologies, institutional relations and governmental rationalities more readily associated with advanced-liberal governmentalities. Bulkeley et al. (2007) found that evidence of new modes of eco-efficiency and waste as a resource ran alongside these historic ways of governing waste.

The repercussions of historic practices on apparent governmentalities also links to the criticisms of those who claim that governmentality is seen as a "completed project" where advanced-liberalism can be used to describe any number of governance techniques (Rose et al. 2006:97). This critique of legacy, in conjunction with the problem of the visibility of neoliberal concepts discussed earlier in this chapter (p180) has led to the opinion that governmentality work should be "messier" (Rutherford, 2007), contextualised (Oels, 2005), and open to the idea that actors within a governance regime may adopt a more critical and reflexive interpretation of techniques than existing neoliberal explanations might allow (McKee, 2009).

Dowling (2009:493) suggest that this "scepticism towards the coherence of neoliberalism" is particularly interesting for researchers concerned with "alternative futures". A goal that sits well with the Sustainability Science underpinning of this thesis. With this in mind, the next subsection looks to explain the rationale behind the ZW policy beyond the rationales attributed in existing Ecogovernmentalities.

6.3 Environmentalism and the ZW Policy

This section of the chapter takes as its starting point Agrawal's (2005) critique of understandings of environmental politics, in which he suggests "even acute analyses of political conflicts and environmental histories are often constrained to reach certain conclusions" (p216). He terms analytical studies of governmentality of the environment as 'Environmentalities' and suggests the theory is used as "a specific optic for analysing environmental politics instead of denoting a particular form of it" (p226). Therefore, in this section, the ZW policy is considered beyond the existing constructions of Ecogovernmentalities. Instead a focus is placed upon the idiosyncrasies of the ZW policy which are left unexplained by Section 6.2 of this chapter but yet which emerged from the research. Specific attention is paid to the fields of visibility formed by the materiality of waste; the techniques associated with reconceptualisation of resources; the importance of multiple sources of knowledge and associated networks; and finally the role of expert agencies.

6.3.1 Fields of Visibility: The Materiality of Waste

The consequences of materiality in shaping governance practices are not unnoticed in governmentality and governance studies, however, a complete explanation of the works of those who explore the ideas of materiality and governance goes beyond the scope of this thesis. Instead, this thesis makes the modest point that the physical materiality of waste offers something of a contrast to the other objects of concern in existing Ecogovernmentality studies. Carbon (Oels, 2005; Methmann, 2011) biodiversity (Tregidga, 2013) and, to a lesser extent, forestry (Bäckstrand and Lövbrand, 2006) cannot be said to have the same ubiquity of everyday impact that waste has on society. This meant that a huge breadth of categories of visibilities was apparent in the data set (see Box 6.5 p188). Russell and Thomson (2009:237) encountered similar issues when accounting for visibilities within Scotland's Sustainable Development Policy, however, they noted that within their 60 identified visibilities, very few were linked to measures, which they suggest limited the impact of these visibilities.

This was found less to be the case in this study: where most interviewees also highlighted the importance of visibilities that were not directly linked to measures. This disparity could be explained by the difference in data used in each study, with Russell

and Thomson (2009) using documentary sources and this research project using a combination of interview and document data. For example interviewees in this study highlighted the importance of engaging with Scotland's public facing industries (i.e. food and drink, hospitality) and consideration of small but highly visible wastes (i.e. mattresses, nappies and plastic bags). The interviewees appeared to recognise the importance of focusing on societally relevant wastes and industries, regardless of whether these visibilities contributed significantly to measurable targets.

Box 6.5: Categories of Visibility Identified in ZW Policy

Waste Infrastructure	Local Authorities	Other Countries	Non-Waste Infrastructure
Private Sector	3rd Sector	Research Bodies	Elected Bodies
General Public	Public Bodies	Waste Industry	Ecological Effects of Waste
Energy	Resources	Local Environmental Problems	Global Environmental Problems
Types of Waste by Material	Types of Waste by Use	Biodegradable Waste	Specific Products

Nevertheless, there was also a wide range of potential measures identified as linked to waste (see Box 6.6 p189). This could be attributed to the diversity of waste collected and the potential for use of that waste, but also the requirement of scale to make it worthwhile to collect the data. The latter point has real consequence for the collection of data at a population level. Waste arisings, recycling rates and, latterly, carbon accounting were identified as important indicators of the success of the ZW policy. However, it was also recognised that collection of this data is messy, often incomplete and does not given an accurate indication of the quality of the materials. Equally these measure are not useful at a household or business level, where recycling rates and waste arising data are generally considered too costly, time-consuming and unpopular to collect. Whilst recycling rates are the most apparent target in the policy, there is no universally acknowledged methodology for collection (except for municipal waste) and, as such, the targets are widely recognised as an insufficient indicator for success in the ZW policy.

Box 6.6: Measures associated with ZW

GDP	Rates of Consumption	Service Satisfaction	Thermal Efficiency
Population Size	Energy Costs	Recycling Rates	Recycled Content of Products
Waste Arisings	Resource Price	Plant Capacity	Number and location of Infrastructure
Volume of Waste	Toxicity	Carbon	Recovery Time
Resource limits	Quality of Recyclate	Awareness	Revenue from Waste Streams

Unlike with climate change and carbon governmentalities there is no readily accessible and universally applicable indicator for waste. The materiality of waste therefore brings two unique aspects to the ZW governmentality: i) waste is a ubiquitous concern which requires input from all sectors of society ii) there is no easy way to understand that concern, nor to measure the impact of government intervention upon it. This is not to say that the materiality of waste does not highlight certain areas for governance: rather that these areas are ZW policy specific.

Arguably it is less the physical state and more the label of waste which centres attention in the policy. It was found that more attention was paid to waste sites and infrastructure, types of waste and end of pipe processes than other places, products or design and manufacturing elements of the production-consumption cycle. This was recognised by the interviewees and many discussed the lack of attention paid to the upper end of the waste hierarchy and the importance of redressing this imbalance. In some ways this mirrors the goal of Civic Environmentalism to listen to excluded voices (Bäckstrand and Lövbrand, 2006). On the other hand, it applies this idea to the exclusion of things rather than identities. This self-awareness was apparent in the techniques used to promote ZW.

6.3.2 Techniques: Reconceptualising Resources and Re-evaluation of Institutions

The awareness of the limitations of the concept of waste are clearly identified through the research data, and this awareness has manifested in some fairly specific techniques of governance. It is suggested that these techniques do not appear to have been fully explored as part of other governmentalities. These techniques were described more fully in Chapter 5; however, here they will be discussed in relation to an underlying governmentality considered specific to the governance of ZW.

It was argued in Chapter 5 that the ZW policy has at its heart the goal of changing how Scotland sees waste: in part it wishes to attribute economic value to the resources but it also wants to retain the importance of the environmental impact of waste. An additional element of ‘missed opportunity’ to gain maximum value from resources was also seen which went beyond the environmental or economic gains. It is difficult to identify the presence or absence of any of these goals in any particular exchange –particularly from the interview data, however, there are some techniques used within the policy which speak louder to the economic goals or environmental aims of the policy. On the other hand, the use of education, policy objectives and the attempts to change the narrative of waste management, all reinforce the idea of the reconceptualization of resource use.

Education is identified as a technique which could be described as a “technology of citizenship” (Russell and Frame, 2013) and thus an element of advanced-liberal governmentality, in that it is designed to encourage positive behaviour. Certainly the advice distributed by ZW Scotland and SEPA would probably fall into this category. However, this type of advice is not the only form of education found within the policy. Individuals, companies and local authorities are encouraged to see waste as a resource, but equally so are designers, manufacturers and community groups. Similarly whilst the ZW Plan sets targets in relation to particular processes (i.e. recycling), almost all interviewees spoke to the idea of ZW being about a change in perspective on resource use to an approach that endeavours to maximise the value (not necessarily economic) of waste. This can be seen in the use of the waste hierarchy which it has been suggested, decouples waste reduction from purely economic efficiency (Hultmann and Corvellex, 2012). This approach speaks more to a “technology of agency” (Russell and Frame,

2013), again linking to the advanced-liberal governmentality of expanding the market into new areas.

This attempt to change the narrative brought to light issues with current institutions and governance techniques. Most notably the planning regimes, dominant business models and waste regulations. It was found that Scotland's planning regime was believed to be central to the success of the ZW policy on account of the lack of existing infrastructure for waste reprocessing. Interviewees argued that the current regime, which is based on local authority permissions, was not fit for purpose for the economies of scale required for ZW infrastructure. As a consequence, as part of the ZW policy, the Scottish Government has introduced capacity predictions and requirements for waste infrastructure on a national level.

This is not to say that ZW policy has returned to a governmentality of sovereign power, as major aspects of the policy remain devolved to local authorities and communities. The link to devolved power also highlights a potentially reflexive governance rationale in ZW policy. The encouragement of community participation in SD policies has been represented as another example of advance neoliberalism and Summerville et al. (2008) are particularly critical of this aspect of SD governance. However, in contrast the ZW policy has brought major infrastructure development back under centralised control.

Questions were also raised in the interviews about the appropriateness of waste regulations in relation to the ZW policy, with some identification that the definition and control of waste were too complicated and inconsistent to allow or encourage widespread treatment of waste as a resource. The argument was that the complicated licencing associated with waste handling meant that many businesses were more inclined to dispose of their waste than find other suitable avenues for the resource. This is being addressed through the multiple reviews of regulations which are being undertaken as part of the ZW policy. Importantly the focus is 'better' not less regulation and the process is being handled by SEPA to ensure that environmental protections remain.

In part, the Better Regulation programme is a reflection of the realisation that businesses must be included within the ZW policy if ZW is to be achieved. Again,

notably, this is not necessarily based on the rationale of expanding the market (as might be suggested by Ecological Modernisation) but rather an identification of the practicalities of the modern economy. Raco (2003) notes that since devolution, Scottish Government policy has been to include business to as a means of legitimising policies. Again reflecting findings on ethical consumers (Barnett et al. 2008, Clark et al. 2007) the inclusion of business was not suggested uncritically. A strong theme of discussion of the importance of alternative business models was identified in the interviews. This was based on the opinion that commercial organisations corresponding to current consumption practices are ill-equipped to operate within the closed-loop system envisaged by the ZW policy. The identification of what this business model might look like was less apparent, reflecting another theme, that different and innovative knowledge is required to achieve ZW.

6.3.3 Forms of Knowledge: Plurality and Knowledge Exchange

Echoing the findings in other elements, it was clear that the favoured knowledge sources and types for the ZW policy were complex. A variety of ways of knowing were identified (See Box 6.7 p192) including both qualitative and quantitative techniques. Sources of knowledge were also identified as expert, common sense, policy based and, importantly for this thesis, interdisciplinary. There was a clear suggestion from the data that the ZW policy required input from all stakeholders. The justifications for this were largely practical but normative reasons were also identified.

Box 6.7: Ways of Knowing			
Targets	Expertise	Case studies	Physical Appearance
Comparisons	History	Pilot Schemes	Networking
Conversations	Statistics	Impact Assessments	Cost-benefit analysis
Lifecycle Assessments	Stories	Legislation	Public Opinion

From a pragmatic perspective it was recognised that the creation of sustainable waste system required knowledge input from a wide variety of sources. An indicator of this is some of the areas for further research suggested by the interviewees (See Box 6.8 p193). It was recognised that input on waste policy was required from such disciplines as ecology, psychology, chemistry, sociology law, political science, economics, geography, education and physics. On the other hand, there was also importance given

to non-disciplinary experts, including those with a history of working in the waste industry, businesses and community groups. There were two practical reasons for this inclusion i) the value of their contextual knowledge and ii) the belief that their participation would result in more popular policy decisions.

Box 6.8: Areas for Further Research Identified by Interviewees

- Material Flow
- Planning and Governance Techniques
- Behaviour Change
- Education and Communication
- Technical Knowledge for Recycling
- Waste Prevention and Reuse
- Governance Goals
- Accountability of Actors

Bäckstrand and Lövbrand (2006) suggest that this sort of democratisation is apparent in Civic Environmentalism governmentality and point to the participatory decision-making in CDM projects as examples. However, Methhham (2011) has suggested that consultations undertaken as part of CDM infrastructure developments are more associated with being seen

to do the right thing, rather than the “reflexive scientisation” envisaged by Bäckstrand and Lövbrand (2006:71). Certainly normative justifications for plurality of knowledge were more difficult to identify, although some interviews did suggest the potential impact on people’s lives made it important to consult them on major decisions; a view echoed in the literature (Petts, 2005). Importantly consultations and consideration of impact related to local populations rather than particularly marginalised groups or international actors. This, perhaps, highlights again the practical justifications as the main driving force behind consultations.

Formalised government consultations during policy and planning development were the not the only form of sharing knowledge identified within ZW policy; one of the key types of techniques used within the policy was networking and knowledge exchange. Like consultations some were more centralised i.e. working groups on particular waste streams (for example textiles), waste problems (for example waste crime) and administrative issues (for example better regulation). The development of the ZW Think Tank which constructed the policy is the most obvious example of these multi-stakeholder working groups, with the experts on the panel representing academia, waste management, civil service, SEPA and independent consultants. ZW Scotland has large

role in creating and facilitating the knowledge exchange within the policy. They run workshops, contribute to conferences and organise knowledge dissemination through their website. The presence of ZW Scotland is considered another defining feature of ZW governmentality.

6.3.4 Formation of Identities: Expert Agencies

The most apparent ‘new’ element of ZW governmentality is the role played by expert agencies. Closely linked to the type of knowledge that is considered important in the ZW policy, expert agencies (like SEPA, ZW Scotland and the Enterprise Agencies) play a defining role, not only in providing advice and guidance on the policy and related matters but also in constructing the arenas for discussions of policy issues. The role of a third party in networking between stakeholders has not yet been discussed in environmental governmentality literature.

The importance of expert knowledge was a key feature of ZW policy and the experts ranged from ecological scientists to local waste practitioners. In this sense expertise was found in practical, professional and academic qualifications. Similarly the inputs of business, local groups and local authorities were valued. This represents an amalgamation of the types of expertise valued in other Ecogovernmentalities. Global Governmentality has highlighted the importance of including the voice of “market participants” in policy decisions (Methmann, 2011:10) whilst Civic Environmentalism discusses the inclusion of local and community groups (Bäckstrand and Lövbrand, 2006). Notably the latter encourages their inclusion as a counterpoint to their previous exclusion from policy discussions. As discussed previously this justification is not central in ZW policy. Rather these groups are beginning to be considered experts in their own rights (particularly in the reuse sector), expanding the idea of expertise considered in Ecological Modernisation governmentality: where credence is primarily given to environmental scientists.

In terms of expert agencies, SEPA and the Enterprise Agencies were seen as representing the expertise which might fall within definitions of Ecogovernmentalities: SEPA being the environmental expert and the Enterprise Agencies offering business and market acumen. What differentiates them from the sort of international expertise of

the agencies identified by other governmentality studies is their focus on Scotland. This offers a somewhat unique perspective on the role of expert agencies, and suggests a sort of hybrid governmentality between Ecological Modernity and Green Governmentality, with a focus on the market, international environmental limits but also a specific state. It offers a reconfiguration of the state as the location of governance and speaks to McKee's (2008) finding that the state still plays a central but different role in shaping governance problems and solutions

Perhaps, more interestingly, and particular to ZW governmentality, is the identity encapsulated by ZW Scotland. In the previous chapter it was discussed how this agency divided opinion amongst the interviewees in this research project, with a confusion from some regarding its role. Despite these ambiguities there was a general consensus that ZW Scotland is a delivery body. It operates by connecting various types of expertise: in some cases by repackaging the information, and in others by making links between actors. ZW Scotland is not seen as an expert in a particular area of waste but rather the system itself. This idea of a delivery body which acts as a conduit between different types of knowledge but keeps a systemic overview, appears to be a new form of identity which has yet to be considered by any governmentality study.

Its central role may previously have been one played by government, however, it was also recognised in the research that the current system of civil servants and political cycles did not allow for the transformational type of development envisaged under ZW goals. To this end, it makes sense to have a non-elected government funded body to provide not only systemic, but long term expert advice on Scotland's waste management system. It is also a particularly interesting identity for waste governance.

Hird et al. (2014) suggest that waste only becomes an issue for governance when it is brought into view through disasters that affect high impact issues like health. They argue that this reactive approach to waste governance means that public engagement is voluntary, isolated and underfunded, leaving the power of implementation of waste infrastructure with corporations. In addition, visibility of waste to the public occurs at the household level, reinforcing neoliberal ideas of governance. This, Hird et al. suggest prevents waste from being a matter of national political concern except in these times of crisis. The omnipresence of ZW Scotland as a continued, funded and knowledgeable

actor in waste in Scotland has the potential to change this dynamic. Waste is encouraged to be a collective responsibility and a matter of governance concern, even outwith times of disasters.

6.3.5 Summary Response to Research Question

Both this section and the previous section used the Framework for Analysis to consider the rationale behind the ZW policy in Scotland. It was identified that various elements of the policies can be explained by existing Ecogovernmentalities (see Box 6.9 p197). It was noted that the links to the advanced-liberal Ecogovernmentalities were particularly strong but it was suggested that not only could their visibilities be explained by legacy of past regimes, but also by an academic focus on these explanations. As a consequence of these limitations, and in recognition that Ecogovernmentalities did not seem to fully explain the rationale behind the ZW policy, this section used the Framework of Analysis in an Environmentality approach to understand the idiosyncrasies of ZW governance. Taken together these sections can be used to answer the research question: what is the rationale behind the implementation of ZW policy in Scotland?

Box 6.9: Summary of Elements of Ecogovernmentalities in Scotland's ZW policy

	Green Governmentality	Ecological Modernisation	Civic Environmentalism	Global Governmentality
Visibilities	Key resources, Scotland, climate change	Key resources, Required Infrastructure	Schools; community organisations, reuse and repair centres	Production consumption cycle;
Techniques	Waste regulations, policy targets, waste licences; EIA	Identification of key resources, collection, grants and loans, knowledge transfer networks, smarter regulation	Quality assurance labels, consultations, networks, reuse services, voluntary groups	Material studies, recydate markets, alternative business models, changing narratives
Knowledge	Recycling rates, resource quantities, carbon emissions, population rates	Material flow, resource efficiency	Local knowledge, alternative lifestyle practices,	Life cycle analysis, material flow, economics
Identities	All stakeholders in Scotland (individuals, business, local authorities)	Funders, businesses	Community groups, social enterprises, schools, active citizens	Market participants, producers, leaders (business)

The findings in this section (see Box 6.10 p198). suggest that the goal of ZW has shifted from the mode of governance of “waste as disposal” to seeing “waste as a resource” (Bulkeley et al. 2007:2740). The policy has a focus placed upon “solidarity”, the “provision of infrastructure” and “non-governmental organisation and networks” as identified by Bulkeley et al. as components of the “waste as a resource” mode of governance. For Bulkeley et al. the drive behind this mode is “reducing the environmental impacts of waste [and maximising] social and economic benefits” (ibid). However, as they and others (Nilsson et al. 2009; Davies, 2008) have found, there are multiple competing modes of governance operating within the ZW policy in Scotland. It was found that the rationale of eco-efficiency: “reducing the environmental impacts of waste” and “recovering value” (Bulkeley et al. 2007:2730) was also present.

On the other hand, the materiality of this rationale of governing ‘waste as a resource’ means that techniques of governance linked to other (arguably more neoliberal) Ecogovernmentalities – were deemed to be incompatible with the goals of ZW and so were critically questioned within the policy. For example, questions were raised about devolving responsibility for waste management; appropriate institutions for ZW; and the roles of individuals, businesses, government and communities. In some instances this has encouraged the adoption of techniques which challenge existing institutions and adopt practices which reflect the rationale of waste as a resource to be managed by all in society: including the development of ZW Scotland, the adoption of the ZW Plan and the widespread use of multi-stakeholder consultations.

Box 6.10: Particular Elements of Zero Waste Governmentality

Zero Waste Governmentality	
Visibilities	material concerns; definition of waste
Techniques	education; objective setting; changing narrative; regulatory reform; planning system; alternative business model
Knowledge	plurality of knowledge; quantitative and qualitative; experts and non-expert; networked
Identities	systems thinkers; expert organisations

Not all elements in the ZW policy reflect this shift to a new mode of governance. It was found that a critical change had occurred in the goals of governing waste, however, the understanding of how to develop techniques that support the ‘waste as a resource’ rationale, or identify alternative practices is an on-going process. This is most clearly seen in the recognition of the limits of current business models and the inadequacy of waste measures, targets and knowledge, and yet the lack of clear solutions to these issues mean existing practices remain. This speaks to Nilsson et al. (2009) findings where they state that a lack of adequate new governance alternatives, meant a reliance on older techniques of waste management.

From the perspective that ZW policy as ‘waste as a resource’ represents a shift towards more sustainable waste governance in Scotland, the identified presence of elements of advanced liberal governmentalities suggest that there is a continued legacy of past governance techniques that may hinder this transition. It has been suggested that a proposed Governmentality for SD can be used as a means through which to identify and modify elements that promote governmentalities that are incompatible with sustainable goals (Frame and Bebbington, 2013). Not only were the goals of the ZW policy seen as linked to SD (see p142) but Frame and Bebbington (2012) highlight resource stewardship as a component of their Governmentality for SD, so it seems complementary to use their framing to provide further insight into techniques that might encourage this a more sustainability focused rationale in the ZW policy. The next section considers the gains that could be made from evaluating ZW governance in light of Governmentality for SD.

6.4 Governmentality for Sustainable Development and the ZW Policy

Through Governmentality for SD, Frame and Bebbington (2012) attempt to offer a future vision of how a holistic governmentality for SD might appear in an Analytics of Governmentality framework (see Box 3.4 p88). Their construction of Governmentality for SD is based on wide literature from across SD governance and they admit that their framing is both “normative and speculative” (p256). Russell and Thomson (2009) conducted a similar exercise to describe the elements of a Governmentality for SD. However, unlike Frame and Bebbington (2012) who use their Governmentality for SD framing as a potential vision to direct future action, Russell and Thomson (2009) use their description to offer an insight into current SD policies and indicators. To a certain extent both approaches are used here.

Earlier in this thesis it was argued that Governmentality for SD stems from the idea that identifying the development of past environmental governmentalities falls short of contributing to transformative goals of SD (see p85). It was suggested that by using an Analytics of Government approach to understanding the rationale behind modes of environmental governance, the identified elements could be compared with a proposed ideal governmentality for SD. The insights from this comparison can suggest interventions to encourage transitions to more sustainably focused governance. To this

end, having presented the governmentalities apparent within the ZW policy in the previous section, this thesis now critically assesses these constructions in line with Frame and Bebbington's (2012) proposed Governmentality for SD and asks the research question: How does the rationale of ZW governance compare with governmentality for Sustainable Development?

The section begins by considering the links between the elements ZW governance rationale identified earlier in the chapter and vision for Governmentality for SD proposed by Frame and Bebbington (2012). It is found through this comparison that although many of the elements of Governmentality for SD can be identified within the ZW policy, that these alignments are linked to a pragmatic rather than visionary approach to governance. It is argued that this pragmatism stems from the idea of waste as a technical and material problem, and it is suggested that the adoption of post-normal techniques of governance that enhance "strong transdisciplinarity" (Max-Neef, 2005) could enhance the development of value-based discussions within ZW. This could create stronger alignment with Governmentality for SD.

6.4.1 Alignment between ZW and Sustainable Development Governmentality

This thesis found that certain elements of Frame and Bebbington's (2012) Governmentality for SD do appear within the ZW policy. Some of these elements are clearly identified within the policy (obvious elements) and some are emerging (partial elements), other elements were not identified at all (absent elements) (see Box 6.11 p201).

Elements of ZW governance that clearly align with Governmentality for SD centre on market-based visibilities and techniques. The ZW policy highlights the need to focus attention on availability of key resources for Scotland's economy (SNIFFER, 2011), which accords with the visibility of 'markets governed by resource availability' presented as part of Governmentality for SD. To enhance market certainty, the SD focused technique of 'eco-verification' can be seen in the ZW policy through the Revolve Reuse labelling scheme. The drive to encourage 'Better Regulation' in the ZW waste policy (SEPA, 2008) with a focus on reducing the regulatory obligations for the

waste industry and business, clearly accords to the ‘reduction of legislation’ that Frame and Bebbington (2012) present as forming part of a Governmentality for SD.

Box 6.11: Alignment Between Governmentality for SD and Scotland’s ZW Policy

	Obvious Elements	Perceptible Elements	Absent Elements
Visibilities	Reduction and Decentralisation of Legislation Markets governed by resource availability	Extended peer communities Locally Driven Entrepreneurship	Agonistic processes
Techniques	Eco-verification Polluter pays Precautionary Principle	Environmental citizens and Communities Agenda 21 localisation Post-normal Science Technologies Ecosystem Services Notion of well-being Synergistic outcomes	Decoupling from Economic Growth
Knowledge	Ecological economics Resource Stewardship Earth Systems Science	Post-normal science Deliberative Strong local trading	Narrative and new civic epistemologies
Identities		Stewardship of global commons Inter and intra- generational equity	Active citizen/consumer
Utopia	Resource stewardship is organising principle	Future matters as does the present	Societal governance with Rawlsian notions of justice

(Governmentality for SD taken from Frame and Bebbington, 2012)

Environmental regulation envisaged as part of Governmentality for SD also reflects current techniques in the ZW policy: for example ‘the polluter-pays principal’ is evidenced in Scottish waste policy through the extended producer responsibility scheme that operates for WEEE, vehicles and some packaging. This EU policy emerged from

the idea that waste production is largely controlled by manufacturer techniques (Thornton and Beckwith, 2004) and like ‘the precautionary principle’ - where steps are taken to protect the environment despite “scientific uncertainty” on potential harms-emerged in Scotland before the adoption of the ZW policy (ibid:181). Since 1996 SEPA have had responsibility for ensuring these environmental principals have been upheld in Scotland through waste regulations and licences.

The highly visible role SEPA plays as scientific experts protecting Scotland’s environment also suggests a strong link to ‘earth systems science’. The importance placed upon SEPA’s technical knowledge in shaping Scottish governance is evidenced not only through their central role in the development of waste policy in Scotland but also in their position as statutory consultees in planning applications. The importance played on the environmental knowledge of SEPA is seen through the decision of the Court of Appeal which concluded that within planning decisions the court should defer to SEPA’s judgement on the environmental consequences of waste developments (North Lanarkshire Council v The Scottish Ministers and Shore Energy [2013] CSIH 58).

The link between the ZW policy and the idea of ‘resource stewardship’ has already been suggested in this thesis (see section 5.2.3 p142). On the other hand, the thesis also found that this ‘resource stewardship’ focused heavily on the resources of Scotland. In section 6.2.1 (p174) it was suggested that this Scottish resource focus pointed towards Green Governmentality explanations of ZW governance. Similarly it is difficult to discern how the observed alignment with the Governmentality for SD elements of ‘reduction and decentralised legislation’ and ‘markets driven by resource availability’ differs from the Ecological Modernisation explanation of ZW governance rationales. Existing academic work has suggested that evidence of techniques associated with SD, do not necessarily show the presence of a Governmentality for SD but instead linked to advanced-liberal governmentalities (Summerville et al. 2008). This could be seen as a limitation of Frame and Bebbington’s (2012) framing.

Other elements of Governmentality for SD identified within the ZW policy also manifest in ways that seem disconnected with Frame and Bebbington’s (2012) vision of a Governmentality for SD. At first glance, the apparent importance given to extended

peer communities – or at least the desired inclusion of multiple stakeholders in the ZW policy process, suggests that elements of Governmentality for SD are highly visible within the ZW regime in Scotland. Although the policy documents suggest that this is active engagement across society, the interviewees were more sceptical.

The interviewees recognised that keen individuals and communities were engaged with the ZW policy (suggesting a presence of ‘environmental citizens and communities’) but believed that the majority of householders did not connect their recycling practices with a larger shift towards a philosophy of more sustainable resource use. Similarly although the ZW policy has developed a policy initiative designed to engage directly with business (Resource Efficient Scotland) some interviewees raised questions about the level of understanding of ZW in business. The interviewees identified some businesses as forward-thinking and embracing ZW, but thought most businesses –at best – focused on ZW as a primarily as cost-saving efficiency approach.

Petts (2005) has suggested that a feature of waste management engagement is where the general public are included in discussions once the objectives and strategy for waste management have been created. She maintains that this is a consequence of the importance placed on expertise in waste policy, which excludes those less knowledgeable about technical waste management. Taking Max-Neef’s (2005) taxonomy of knowledge, the engagement with individuals on questions of recycling and businesses on resource efficiency suggests that in ZW stakeholder contributions are limited to the pragmatic questions of “what exists” and “what are we capable of doing” . rather than the more normative questions of “what we must do” and “how to do what we want to do”. This marks a contrast with earlier manifestations of the ZW policy, where the ZW Think Tank (a notably diverse group) appeared to actively engage in normative questions to be addressed through the policy aims (see Box 5.1 p137).

Looking across elements of the ZW policy and those proposed for governmentality for SD (see Box 6.11 p201), it can be seen that alignment occurs most closely on aspects of requiring positivist knowledge (both technical and ecological), traditional techniques of environmental governance (legislation and legal principles) and market focused visibilities. On the other hand divergence occurs in relation to problematising existing practices (‘decoupling from economic growth’), appreciation of new and alternative

ways of knowing ('civic epistemologies') and participation with different groups in discussing and developing the policy objectives ('active citizenship'). Contrasting the elements of alignments with absent elements shows that although the ZW policy engages with multiple stakeholders, it does so in a way to avoid critical engagement with wider political goals and values.

Russell and Thomson (2009:232) state that Governmentality for SD requires participation; equity; solutions beyond technology and "long-term transdisciplinary evaluations". Frame and Bebbington (2012) also present Governmentality for SD as requiring a plurality of perspectives on normative questions which lead to critical evaluation of current practices. Although the ZW policy does purport to encourage participation, this thesis has found that the normative questions in waste management are often overshadowed by the technical considerations of waste in the ZW policy. If the ZW policy is to develop elements that reflect Governmentality for SD, then a focus should be placed upon achieving "strong transdisciplinarity" which encourages multi-stakeholder participation in both practical and normative discussions. The next section of this chapter will present three techniques that could be used to encourage more transdisciplinary contributions to the ZW policy.

6.4.2 Enhancing Governmentality for SD in ZW policy

Max-Neef (2005:15) argues that transdisciplinarity is a practice that can "improve our understandings of the social world and of nature" by drawing attention to our limitations and assumptions of existing knowledge. Similarly Frame and Brown (2008:226) argue that post-normal science "implies a qualitative change in the way science and policy-making are approached" drawing "attention to aspects of uncertainty and values that are typically down-played or ignored in more traditional research".

In their study of technologies for sustainability in Scotland and New Zealand, Russell and Frame (2013:103) also found that water policy focused heavily on the technical knowledge contend that the policy is "missing" the contributions of academic analysis and framing. They argue that post-normal technologies could be used to develop science and citizen relations to promote a "creative and socially robust approach to sustainable transitions" (ibid). Frame and Brown (2008) contend that developing post-normal

science technologies can promote sustainable transitions and suggest that elements of post-normal science could be extended to governing practices.

Frame and Brown (2008) offer three ways in which post-normal technologies can enhance sustainable governance: extended peer-communities; agnostic processes; ecological citizenship. This section will consider each of these arrangements in relation to the ZW policy. These concepts are widely discussed in other literatures and the purpose here is not to debate these contestable terms. Instead, within this thesis these concepts are used to present three possible ways in which to open out thinking about governance in the ZW policy.

It has also been suggested that post-normal science can identify constraints to implementation of post-normal technologies, suggesting it offers “integral mechanisms for institutional reform” (Frame and Brown 2008:237). This fits well with a Sustainability Science aspiration for research that is solutions oriented. As a consequence, in addition to critically assessing the ZW policy in relation to post-normal technologies, suggestions will also be made as to how these technologies could be promoted within the Scottish context.

For Frame and Brown (2008:233) an extended peer community involves increasing the participation of a wide group of participants in both “decision-making and policy implementation”. Engagement with an extended peer community is not straightforward; it requires mutual respect, time to understand alternative perspectives and identification of potential ambiguities. The findings in this thesis suggest although the ZW policy purports to have used consultations with “individuals to local authorities, businesses to campaigning organisations” which “highlighted a very wide variety and depth of concern and interest about Scotland’s waste” (Scottish Government, 2010:vii) there are still stakeholders whose views are less valued and forms of knowledge which are less readily engaged with.

In the previous section 6.4.1 (see p200 for discussion) it was suggested that although multiple stakeholders contribute to the ZW policy, the perspectives of the general public are seen as less central than expert contributions. Much of this perception appears to be based on the idea that the public does not understand the waste process. Petts and

Brooks (2006) found that public views were excluded from discussions of air pollution for a similar reason: that the issue was too technically complex for a lay-person to understand. They suggest that this presents a limited role for lay knowledge in environmental governance and argue that contributions of non-experts lies in appreciation of the “socio-political framings” of the problem (p1054).

Davoudi’s (2006: 694) research supports these findings from a waste perspective: suggesting that within waste, expertise, solution-focus and “technical rationality” predominate to the expense of more socio-political debate. Petts (2004) argues that this approach may be counterproductive. She notes that the waste industry often presents the public as ignorant of the risks of waste and so unable to contribute to policy level discussions. In contrast she contends that engagement with the public on framing the risks associated with waste would both educate the non-experts and challenge existing assumptions about the nature of waste problems, with laymen acting as “counter-experts” to established ideas in waste governance.

Within the ZW policy the role of expertise and technical knowledge is given higher priority than the critical evaluation of the basic assumptions of waste governance in the Scottish ZW policy. The lack of engagement with civil society organisations who operate in public discussions of other environmental issues (i.e. Friends of the Earth), in conjunction with the historic neglect of the Scottish waste regime from academic circles, has limited the engagement with those who can critically evaluate waste management processes in Scotland in relation to wider societal goals. Moreover the general public have been labelled uninterested or ignorant of waste management, meaning they are engaged with somewhat superficially, undermining their ability to both contribute to and grasp the bigger shift in resource philosophy presented by the ZW policy.

As a consequence, the ZW policy could benefit from inclusion of more ‘counter expert’ perspectives. In particular, the ZW regime would benefit from the inclusion of social science perspectives which can “question the basic assumptions of modern society” (Spangenberg, 2011:279) and active engagement with the disciplines which consider societal values. The nuances of discard and the importance of context of waste identified in Section 2.2 (p28) of this thesis were absent from most the interviews and

policy documents. Moreover, when asked, some interviewees admitted that stronger connections could be made with academia, particularly to challenge some of the existing assumptions in the policy. It was recognised that these different accounts of wastes could contribute to a more holistic understanding of the waste system in Scotland. Frame and Brown (2008) argue for the need to include multiple and opposing accounts through the use of agonistic processes.

For Frame and Brown (2008) agnostic processes are those that are sensitive to socio-political conditions and respecting of the contrasting ideologies that shape interpretations of SD. This idea emerges from concept of agnostic pluralism coined by Mouffe (1999) in which political theory moves beyond the concept of deliberative democracy. Mouffe raises the impossibility of the Habermasian “ideal speech” scenario, where individuals are free to debate, reconsider and come to a consensus on polarising ideas. Instead she argues for a political theory which takes account of the omnipresence of power in political discourse. This agnostic pluralism acknowledges conflict as an inherent part of democratic process and suggests that the prospect of democratic consensus is a false illusion. Frame and Brown (2008: 235) suggest that this perspective allows for the realisation of “effective means” to deal with real world political situations.

Agnostic processes permit the involvement of different accounts and are sensitive to power dynamics (ibid). For Frame and Brown (2008) post-normal science can offer the framing through which to raise awareness of the power dynamics between different stakeholders. Extrapolating that idea with a governmentality perspective, post-normal science can also offer the framing through which to raise awareness of the power dynamics between different ideas and forms of knowledge. At the moment this level of analysis (either in relation to stakeholders or ideas) is not identifiable in the ZW policy.

This is attributable to the continued perception that most people in Scotland do not understand the technicalities of waste management and so engagement for individuals and businesses is limited to discussions of waste within everyday practices. The inclusion of non-experts in shaping waste management practices is less encouraged. Petts (2004) suggests that this view is common in waste management and yet she argues it underestimates the ability of “counter-experts” to appreciate and acknowledge

technical knowledge. She promotes a kind of ‘agonistic process’ in which waste experts work together with non-experts to frame the problem and investigate solutions. This process aligns closely with the Sustainability Science approach outlined in section 4.3.1 (p117).

Waste has not appeared as a key area of research in Sustainability Science, nor is there evidence of sustainability science type approaches within the ZW regime in Scotland. Research for the ZW policy is primarily directed by ZW Scotland (alongside input from SEPA and the Scottish Government). It is conducted either internally or invited through tenders. Research tends to be presented as stand alone reports, which a number of interviewees suggested predominately sat on shelves. Using a Sustainability Science process where multiple actors contribute to the problem-framing, solutions and evaluation may make this research more relevant and practically applicable. Moreover, it could enhance transparency: overcoming the critique that ZW research in Scotland appears scattergun.

The idea of using an active civil society to disrupt commonly held ideas about environmental problems is broadly encompassed in the concept of ecological citizenship. This concept is described broadly as “an intersubjective community based account of the rights and obligations of individuals in connection with sustainability” (Dobson, 2007:133). Ecological citizenship is also the final link made by Frame and Brown (2008) to using post-normal technologies to enhance SD governance.

The concept of citizenship is widely discussed within environmental political theory. For Frame and Brown (2008:235) ecological citizenship “enables people to be credited with multiple capacities and expertise that can support the co-production of knowledge about sustainability in dialogic fora” and requires citizens to “take issues beyond token understandings of democratic participation, dialogue and engagement” (p236). Hobson (2013) found that citizens often initially engaged deliberatively with environmental within particular contexts, however, outwith these areas, they are faced with “unsupportive”, “disinterested” and “hostile” receptions (p69) and thus become disillusioned. She suggests that engagement with “interventions aimed at fostering environmental citizenship” rather than critiques of existing practices will make “some contribution’ to environmental citizenship” (ibid). For Frame and Brown (2008:236)

this intervention comes through “political spaces where a broad range of individuals and collectivities can engage in robust debate”.

Hird et al. (2014) suggests that in waste, citizens are engaged either as active recyclers or protestors to perceived public health issues. The same can largely be seen in the ZW policy in Scotland where the public are perceived as recycling householders or posing NIMBY (not-in-my-backyard) barriers to new infrastructure. With a few exceptions, outside of these scenarios there is very little civil society discussion of waste management in Scotland. A number of interviewees identified this as problematic for the development of ZW.

An obvious location for these types of discussion is within the education system. A number of interviewees suggested that encouraging discussions towards students could change the visibility of waste for the next generation. It was highlighted in the interviews that there is little interaction between the ZW regime and academia and yet, a number of sources in the literature suggest that universities offer an ideal space in which to expand ideas on ZW and waste practices (Bulkeley and Gregson, 2009; Lehmann, 2011).

This section has shown that there are three ways in which post-normal technologies could develop a more critically reflective governance for ZW which actively acknowledges socio-political powers, potentially allowing for appreciation and identification of inherent values and socially-constructed ways of knowing with the policy. It argued that post-normal technologies could develop some of the missing elements of the governmentality for SD within the ZW policy.

6.4.3 Summary Response to Research Question

The latter half of this chapter has attempted to provide further depth of understanding to the rationale behind ZW governance practices in Scotland by evaluating it in light of rationales for SD governance and by asking the research question: How does the rationale of ZW governance compare with Governmentality for Sustainable Development ?

It was found that elements of ZW governance link to those identified as forming part of Frame and Bebbington's (2013) Governmentality for SD. These connections were most readily seen in the visibilities and technique elements of the Framework of Analysis where resource focus, deregulation and technical expertise were presented as aligned with a Governmentality for SD. It was also noted that, although elements of the Governmentality for SD can be seen in the ZW policy, these run alongside other governmentalities. It was suggested that these contextualised governmentalities can shape the meaning of terms used in Frame and Bebbington's (2013) construction of Governmentality for SD. As was seen in Russell and Thomson's (2012) work, strategies for SD in Scotland have not always encompassed the ideas associated with SD in academic literature and it was somewhat difficult to discern between environmental governmentalities in ZW for certain techniques and visibilities.

In contrast it was suggested that the knowledge and identities identified in the ZW policy, echoed but did not fully encapsulate the type of research and critical thinking, nor active engagement thought required in a Governmentality for SD. This thesis argued that promoting strong transdisciplinarity could enhance elements Governmentality for SD currently lacking in ZW governance. It was suggested that this could be achieved by adopting post-normal technologies in governance in three ways:

- i) Developing extended peer communities by expanding discussions of ZW policy visions into wider society
- ii) Promoting agnostic processes by encouraging Sustainability Science type research in ZW policy
- iii) Cultivating ecological citizenship by developing spaces for open discussion on waste in Scotland

6.5 Chapter Conclusions

This chapter used the theoretical lens of governmentality to make sense of the rationale behind governance techniques and the objective of the ZW policy. Recognising the limitations of governmentality and trying to steer understandings of governance rationale towards more practical contributions to sustainable transitions, the chapter aimed: to critically assess the governmentality of the ZW (ZW) policy in Scotland in relation to Governmentality for SD

The chapter began by comparing the findings from this thesis with the Ecogovernmentality theories from existing literature. It was found that the liberal governmentality of Ecological Modernisation and Green Governmentality were both present within the ZW policy in Scotland, however, it was also argued that the predominance and, therefore, concise consideration of these governmentality in the literature meant they were more developed and so potentially easier to identify. As a consequence, two further Ecogovernmentalities were reviewed: Civic Environmentalism and Global Governmentality. Again, elements of these government rationales were also found within the ZW policy. Using the Framework for Analysis, it was possible to offer a picture of how these four governmentality presented in the policy (Box 6.9 p197).

Despite the presence of four governmentality, it was suggested that elements of ZW governance remained unexplained and so the middle part of the chapter discussed the more unique elements of the ZW policy. This discussion centred around four distinctions identified in the policy: the importance of materiality; a reconceptualization of resources; the importance of plurality of knowledge; and the role of quasi-governmental expert agencies in delivering the policy. It was suggested that these elements point to the presence of a 'waste as a resource rationale' behind the ZW policy linking it to a Governmentality for SD.

The final section reviewed the rationale behind ZW governance in relation to Governmentality for SD. It was suggested that whilst there were elements of the Governmentality for SD which spoke strongly to some of the findings from this thesis, there were also questions left unanswered. Linking to the methodological underpinning of this thesis, the potential contribution of Governmentality for SD was considered in relation to the unresolved governance problems of the ZW policy; most pertinently focusing on the use and acceptance of multiple ways of knowing and the encouragement of critical thinking.

It was argued that the promotion of post-normal science could provide further insight both into governance practices that support ZW rationale but also in identifying those elements of the ZW policy that do not align with Governmentality for SD. The findings

suggest that multiple governmentalities operate within the ZW policy sphere and there are often frustratingly messy to understand and, therefore shape. Nevertheless it was suggested that studies which seek to make sense of this mess have the potential to encourage critical reflection and policy change, but only if used in a post-normal science way.

This chapter has used governmentality in a uniquely analytical way to understand ZW governance in Scotland. Ecogovernmentalities were used to identify both the presence of historic governance rationale and the limitations of their contribution to understanding ZW governance in Scotland. Then, taking a more Environmentality approach (a general application of governmentality) but using the same Framework of Analysis, insight was gleaned into the ZW policy that suggests a change in the rationale behind waste governance. It was also found that a lack of critical understanding of the ways in which existing governance practices operate, might undermine that rationality. Finally, in response to the critiques of governmentality and the belief that it can be used to identify environmental governance interventions, the 'speculative' construction of a governmentality for SD was used against the same Framework for Analysis.

The Framework for Analysis as used in this Chapter arguably represents a Sustainability Science approach which mirrors the structure of this thesis. It set out to problematise Ecogovernmentalities in relation to ZW, it used Environmentality to understand that problem and then used insights from Governmentality from SD to identify potential solutions. It is hoped that this offers a reflexive application of the theory in a way that complements the methodological base of this project and it is suggested that it offers a first step in presenting a more transdisciplinary account of ZW.

This thesis represents a project that uses socio-political perspectives through Sustainability Science to create a space for discussion of the sociological aspects of ZW. In that the thesis argues for adoption of similar approaches to enhance Governmentality for SD in the ZW policy, an evaluation of the framework of governmentality used in this thesis provides a further contribution to understanding the role of post-normal technologies in fostering Governmentality for SD. The final chapter in this thesis conducts this evaluation.

7 Evaluating the Project: Governmentality as a Framework of Analysis for ZW

7.1 Introduction

This concluding chapter offers a reflection on the research strategy, findings, and contributions of this thesis. This process is arguably a necessary step in any thesis which attempts to use Sustainability Science as its methodological ballast. The chapter does not introduce new concepts, data or literature, nor does it summarise previous chapters but rather reconsiders existing ideas from within this project to evaluate the contributions of this thesis to knowledge of ZW governance in Scotland.

This chapter seeks to meet the final aim of this thesis: *to investigate governmentality as an analytical framing through which to understand the governance of ZW in Scotland*. This aim is driven by the proposed requirements of Phase 3 of the ideal Sustainability Science research project (Lang et al. 2012:34) where it is argued that the project must generate and evaluate “targeted products” for “societal and scientific impact”. It is taken that this thesis forms the main product of the research project, which is supplemented by a sector focused summary (See Appendix 6 p281).

The chapter is split into three sections; the first section revisits the first two research aims of the thesis: i) *to develop an understanding of ZW governance in Scotland* and ii) *to critically assess the governmentality of the ZW policy in Scotland in relation to governmentality for SD*. Discussion is based on a critical reflection of achievement of these goals within this thesis. It is argued that this exploratory research project offered a window into the messy arena of ZW governance in Scotland but also presented a new perspective on how the concept of ZW could be further developed in policy. The second section then evaluates these findings in relation to credibility, salience and legitimacy. These criteria are argued to be the central tenants of quality Sustainability Science research (Cash et al. 2003; Miller, 2013). Finally the third section offers concluding thoughts on the contributions of this thesis and potential avenues for future research.

7.2 Taking Stock of the Research Aims

This research began with three aims which were empirical, conceptual and methodological. In Chapter 1 it was explained that the first and second of these aims were translated into research questions used to direct investigation into the ZW policy in Scotland. The responses to these research questions can be found in Chapters 5 and 6. The following section will consider these findings in relation to the research aims.

7.2.1 Developing an understanding of ZW governance in Scotland

The first aim of this thesis – to develop an understanding of ZW in Scotland – emerged from three observations i) the absence of socio-political research on waste in Scotland; ii) the lack of academic research on the governance of ZW; and iii) the creation of a new and self-proclaimed “world leading” ZW policy in Scotland (Scottish Government, 2008a). This aim has been met by mapping the history, actors, goals and techniques of ZW governance in Scotland. In this sense the research project contributes to academic knowledge of *what* and *who* is involved in the ZW policy in Scotland.

The thesis found that ZW has manifested through policy, both as a specific and measurable target, and as a more general shift in the philosophy of waste governance from waste as a problem to waste as a resource. This shift has both been driven by and created the need for new policy interventions, including: engagement with a wide range of actors (through Resource Efficient Scotland and ZWSVP); the development of a new organisation to enhance this multi-stakeholder engagement (ZW Scotland); creation of and funding for new national objectives and strategies (the ZW Plan, the Plastics Reprocessing Fund, Revolve labelling scheme); as well as the development of existing governance techniques like legislation (Waste (Scotland) Regulations 2012).

However, this thesis has also moved a step further and has attempted to paint a picture of the complex, and sometimes somewhat indeterminable, art of waste governance. Using a governmentality perspective to identify the rationales of governance and to make links between ZW goals and ZW policy interventions, the thesis has presented an understanding of how ZW is governed in Scotland. This presents a new understanding of ZW governance for academic audience, but also, it is hoped, offers an alternative

perspective for those working within ZW. The potential repercussions of this new perspective were explored as part of the second aim of this thesis.

7.2.2 Critically Assessing the Governmentality of the ZW policy in Scotland

The second phase of this thesis was driven by the objective of creating a conceptually informed socio-political perspective on ZW governance in Scotland. This objective was driven first by identifying the potential of governmentality to provide an additional layer of insight into waste governance in Scotland, and second by considering the potential of the ZW policy as an empirical opportunity to apply a future-oriented framing of an environmental governmentality analysis. These perspectives formed the second aim of this thesis: to critically assess the governmentality of the ZW policy in Scotland in relation to Governmentality for SD.

This aim was met by using literature on environmental governmentalities to develop a process which identified: existing conceptualisations of *specific* Ecogovernmentalities in the ZW policy; *general* elements of rationale behind practices of ZW governance; and alignments between these two perspectives and Governmentality for SD. This thesis found that the ZW policy aligns in part with Governmentality for SD, particularly in relation to the techniques, actors and forms of knowledge that link to the practical ecological management of waste in Scotland. However, this thesis argued that the rationale behind ZW governance did not include some of the more critical and value-based perspectives of SD governance.

It was suggested that this was a consequence of the importance placed on technical knowledge in ZW governance and that adoption of “strong transdisciplinary” perspectives through the encouragement of post-normal governance techniques could provide more value-based discussions within ZW governance. This thesis submits that this could further align ZW governance with Governmentality for SD. This claim is not meant to provide a solution to the problem of unsustainable resource use, but instead is intended to provide additional insight into how the concept of ZW could be developed to form part of a transformative shift towards more sustainable waste governance.

Nevertheless, it was also argued in this thesis that Sustainability Science aims to be solution-oriented and research suggests studies should produce outputs designed to promote sustainable transitions (Lang et al. 2012; Miller, 2015). A summary of the empirical findings of this thesis has been produced for policy-makers (see Appendix 6 p281). This “societal focused output” (Lang et al. 2012:34) will be distributed after the thesis has been examined.

The thesis itself is intended as the “scientific output” (ibid). The thesis offers two contributions i) clarification on the concept of ZW in policy and ii) development of a process to investigate and evaluate governmentalities in relation to SD. It is suggested that in an ideal Sustainability Science research process, that these outputs must be evaluated (Lang et al. 2012). The next section offers an evaluation of this thesis.

7.3 A Sustainability Science Evaluation

The evaluation criteria chosen in this thesis are those identified as relevant to Sustainability Science. In Chapter 4 (p121) it was explained that quality Sustainability Science research is take to require credibility, salience and legitimacy (Cash et al. 2003; Miller, 2014). These criteria are necessary to ensure that the project findings are relevant to and understood by both societal and scientific stakeholders.

7.3.1 Credibility

Chapter 4 of this thesis presented the concept of credibility in Sustainability Science projects as linked to, but not synonymous with the validity expected in all qualitative research projects (p121). In this sense the research should be in accordance with existing research on the topic (Saumore and Given, 2008:795). This sub-section reflects on the findings of this thesis in relation to the supporting literature. As the findings are presented from a problem-based perspective, rather than based in one literature, the credibility has been assessed in relation to the three supporting research domains. This research project has framed and studied the ZW project in a new way and so the subsection concludes by reflecting on the consequence of credibility in combining these three literatures.

The literature review in Chapter 2, offered three potential areas for research contributions from this thesis: understandings of waste in Scotland; development of the

concept of ZW in a policy context; and insights into the governance of ZW. The extent to which literature can be used to examine the research findings for each of these areas varies: there was no literature on waste governance in Scotland. Similarly many of the definitions – and certainly the political side – of ZW have emerged from society rather than academic literature. Nevertheless existing literature on waste governance elsewhere can be used to support the findings in this thesis in the Scottish context and whilst no literature explicitly considers the definitions of ZW within any given national policy context, the findings from this thesis are supported by a patchwork of existing studies on ZW policies.

The thesis argues that the concept of ZW provides new goals, expanded scope and alternative approaches to waste governance in Scotland. However, reflecting Zaman's (2015) research, it was shown that multiple interpretations of ZW present within the Scottish policy context (see p135). ZW was shown to be linked with specific targets – most notably increased recycling rates – a finding which was also supported by Zaman's work. Although literature has presented targets as problematic: arguing that they can encourage a myopic focus on measurable goals rather than larger shifts in mind-set (Watson and Bulkeley, 2005), this thesis also argued that ZW went beyond target objectives and was perceived as a change in philosophy of resource use. This shift in perspective incorporated many ideas that were included in the literature including of resource stewardship (Davies, 2008); systemic thinking (Curran and Williams, 2012) and circular design (ibid).

In contrast, unlike definitions of ZW that have emerged from civil society, ZW in Scotland is not seen as synonymous with anti-EFW. This thesis has shown that this might be because ZW has emerged as a centralised policy, rather than a bottom up action. This represents a different development from what might have been expected from some studies where ZW has been depicted as a grassroots movement (Davies, 2008; Connett, 2013). However, some literature has suggested – or implied – that ZW goals had also been developed by government (Phillip et al. 2011; Murphy and Pincetti, 2013). The thesis found that this centralised approaches employed new techniques to promote ZW through policy, some of which were critiqued by interviewees. This could also be expected from the literature where it has been suggested that new styles of governance can prove uncomfortable (Davoudi and Evans, 2006).

This explanation is further supported by the observation that the discomfort partly emerged from interviewee perceptions that policy objectives were confused. This thesis argued that this could be attributed to the multiple approaches of waste governance which included new innovations and historical techniques. Bulkeley et al. (2007) noted that a number of modes of governance can exist within one policy regime and – as in this thesis – research has found that this can provoke issues of valued knowledge (Davoudi, 2006) and appropriate techniques (Nilsson et al. 2009).

The techniques used to promote ZW also reflected findings in the literature. The ZW Plan as a strategy document was deemed to be very important, as was the incorporation of multiple stakeholders' views: both of which have been identified as a key aspect of sustainable waste management systems (Seadon, 2010). Similarly, this thesis argued that both technical and social knowledge are required for these systems, a finding which is supported by the work of Davoudi (2006). This thesis identified that the role of central government in promoting techniques associated with ZW was important, a finding that supports Gille's (2010) claim that waste governance research needs to take a more macro scale perspective. This finding is also supported by governmentality research, where it has been suggested that governance studies too readily disregard the place of the state in the practice of governing (McKee, 2008).

Other governmentality studies were also found to support the research, these predominantly linked to the application of governmentality theory. Literature supports the findings of the variety of governmentalities identified in the ZW policy; limitations of existing governmentality approaches; and use of frameworks for analysis and multiple data sources. There are few developed governmentality studies on waste and the theory has not been used previously to understand ZW governance and so focusing on discussions of application rather than specific outcomes of studies seems sensible. Nevertheless, empirical research from the sustainable development governmentality literature also supports the findings in this thesis.

Chapter 6 identified the presence of a number of different governmentalities within ZW, as findings from other studies may have predicted (i.e. Oels, 2005; Russell and Thomson, 2012). Similarly links to advanced-liberal governmentalities (depicted as

Green Governmentality and Ecological Modernisation) were easily identified. As Oels (2005) notes, this thesis found that distinguishing between the advanced-liberal governmentalities was somewhat arbitrary, but that the attention paid to these constructions of governmentality in the literature made them more apparent (Agrawal, 2005; Dowling, 2010). Building on this idea, it was found that elements of Civic Environmentalism and Global Governmentality - as two alternative governmentalities- were also identifiable within the ZW policy.

Returning to the idea that identification of existing governmentalities can be used as “heuristic devices” (Rose et al. 2006:89) and responding to the claims that governmentality should be used to “disturb common sense notions of power” (Rutherford, 2007:302), the thesis argued and found that additional insight into the governmentality of ZW could be gleaned from looking beyond existing constructions of governmentalities. This approach has been widely supported in the literature (see Dowling, 2010, for discussion). The findings from the Environmentality analysis (see section 6.3 on p187) link more closely to the idea of ZW as a new way of thinking about resources, supporting Bulkeley et al’s (2007) research on shifts in modes of waste governance.

Attention was also paid to the application of governmentality and reflecting the choices of numerous governmentality studies, an analytics of government approach was taken. The thesis found that use of an existing framework was a useful tool to shed light on “invisible rationalities” (Bebbington and Gouldson, 2007:2) and link the governance techniques of ZW with existing governmentalities. The framework was also helpful in identifying the elements of ZW governance that did not pertain to environmental governmentalities identified in other studies. As a consequence, this thesis joins those who have sought to use the analytics of government approach to understand environmental governmentalities (Oels, 2005; Bäckstrand and Lövbrand, 2005; Bebbington and Gouldson, 2007; Russell and Thomson, 2012; Frame and Bebbington, 2013).

Some of these studies have only used their framework of analysis to consider environmental policy documents and in this respect, this thesis differs in its application of the framing. This project called upon interviews as well as documents, not only as

research data but also – in line the Sustainability Science framing – the interview data was used to reshape the thesis' Framework for Analysis. The approach of using multiple forms of data has been made popular in governmentality studies of other issues: for example social housing (McKee, 2008, 2009) and food and consumption practices (Dowling 2010; Hobson, 2009). As within other studies, the “realist approach” (McKee, 2009) in this research project was found to provide critical insight from interviewees on the policy which offered a different perspective on the application of the ZW policy than research that has focused on documentary evidence might have found.

The findings in this thesis showed that the links with Governmentality for SD and Scottish ZW policy are perhaps stronger than studies of other policies have suggested (Russell and Thomson, 2012; Frame and Bebbington, 2013). Other relevant empirical findings suggested that the ZW policy was a consequence of particularities of the Scottish context. This view is also supported by research which identified similar governance techniques used in other policy areas in Scotland (Raco, 2003) and links between existing governmentalitys and governance of new policy areas (Keskitalo et al. 2012). As a consequence, the thesis argued that analysis which seeks to understand a shift from existing governmentalitys to Governmentality for SD should both engage with the specific policy context and include the views of actors in that context, focusing on the goal of ‘strong transdisciplinary’ interactions to ensure discussions of values. This finding speaks to arguments identified within Sustainability Science literature.

The literature discussion of Sustainability Science ontology and epistemology was outlined in chapter 4. In that chapter it was suggested that Sustainability Science is both a normative and practical research strategy: in which the project is “defined by the problems it addresses” (Clark, 2007b: 1737). As a consequence, Sustainability Science is faced with difficult ontological choices, which many researchers chose to overcome by engaging in transdisciplinary research.

It has been suggested that although transdisciplinarity allows researchers to overcome ontological dilemmas, that in practice transdisciplinary Sustainability Science has had little influence in promoting sustainable transitions. In part this has been blamed on the focus on current studies placed on single “case-based solutions” (Wiek et al. 2012:22).

This links to the findings from this research where it was suggested that engagement with wider stakeholder perspectives in waste governance in Scotland is often limited to site-specific planning applications or directed questions on a particular topic.

Similarly it was found that although networks of stakeholders engaged in policy discussions on ZW, these stakeholders were usually technical specialists in waste management. It was suggested that the “expert culture” in waste (Petts, 2005) often undervalues knowledge from other stakeholders. As a consequence, this thesis argues that there is an absence of values-focused discussion in ZW policy which limits the development of some of the more critical elements identified within governmentality for SD. This also links with research on transdisciplinarity in Sustainability Science, where it has been recognised that there is an over-reliance on pragmatic interdisciplinarity and lack of engagement with values that underpin these pragmatic ideas (Miller et al. 2014). As this thesis argues, others have claimed that failure to engage with these values limits the potential to transition towards sustainability (ibid).

Finally it was suggested that even if elements of transdisciplinary thinking are evident within the ZW policy, these may be hindered by lack of institutional support. Particular attention was paid to the potential contradictions with other Scottish Government policies and the importance of ensuring clarity and transparency of actors involved in ZW governance. This also speaks to issues with transdisciplinarity identified by Sustainability Science research, where institutional barriers and lack of legitimacy are both recognised as potential concerns (Felt et al. 2013; Wiek et al. 2012).

This section has shown that the research findings in this thesis are credible when compared to existing literature on ZW governance, Environmentality and Sustainability Science methodologies. However, Sustainability Science also maintains that research must be “connected to the political agenda for sustainable development” (Kates et al, 2001:642) and so the question of salience of the research is also important. The next section will evaluate the salience of this project.

7.3.2 Saliency

As concept of saliency relates to the goal of Sustainability Science to be problem-driven and societally relevant. For Lang et al. (2012) saliency links closely to satisfying the expectations of stakeholders. This thesis considers the criteria of saliency by reflecting on whether the findings correspond with “areas for further research” identified from the interviews and discussed in Chapter 5 (p171) and whether it contributes to questions emerging from academic literature.

Sustainability Science advocates that research should be aligned with societal problems, therefore, as part of the research design, all interviewees were asked what further research they thought was required in this area. Chapter 5 showed that most interviewees called for a wide range of additional research and a number of themes emerged (see Box 5.6 on p171). Additional knowledge of the material system of waste was a key theme, with interviewees calling on more data on material flow; life cycle assessments; construction and industry waste; resource requirements; areas for growth; and end markets, amongst other things. This could be seen both as a reflection on the type of knowledge valued historically within waste management policy and as a legacy of the historical neglect of waste data in Scotland.

Governance issues also were identified as a key issue for future research. These emerged in 3 themes: planning and governance techniques, governance goals and critical thinking. Unsurprisingly, there was no clear call for a specific study into the rationale behind ZW. Instead it is thought that the research findings in this project contribute to understandings of ZW policy under three themes: clarification of governance goals; contributions of critical thinking; and solutions for policy development.

Some interviewees felt that there was confusion over the goals of the policy, and sought more clarification on the objectives of the ZW policy. They identified ambiguities in the governance goals, direction of the policy and roles of actors involved as areas for concern. In chapter 5 of this thesis attention was paid to the objectives of the ZW policy and it was ascertained the ZW presents as both a target and a philosophy. It was suggested that these goals encompass three objectives: i) reducing waste to landfill; ii)

taking a new perspective on waste as a resource; and iii) expanding the scope of waste management in Scotland.

On the other hand, throughout the research it was found that the picture of waste governance in Scotland is unclear to outsiders, with understandings of the regime contained within experiential knowledge of those directly involved with the policy and waste management. This thesis has provided a mapping of the policy objectives and techniques which cannot be found elsewhere. The relationship between these techniques and the perceived inadequacy of historical practices of waste governance in Scotland has also been identified. This information will provide those confused by the policy to make sense of actions, and for those with scant knowledge of waste governance in Scotland to understand how the ZW policy developed.

Reflecting on past and current waste governance techniques is important because – as one interviewee noted – this knowledge can help ensure that future actions are made more coherent. This links to calls for transformational knowledge for sustainable waste management that formed part of the critical thinking theme. Some interviewees believed that the ZW policy required more engagement with academia to create new ideas and innovative ways of thinking and a need to evaluate current policy practices was also identified.

This thesis has responded by adopting a critical analysis of ZW through governmentality theory. Chapter 6 highlighted the multiple rationalities present within the ZW policy, which arguably not only contributes to the goal of taking stock but also provides insight into how the policy might transform waste practices in Scotland. This latter point connects to the innovative approaches identified in section 6.3 (p187) where it was found that the ZW included a plurality of knowledge; encourages systems thinking; and places an importance on materiality.

This new way of thinking about governance also speaks to those interviewees who called for more research on innovative forms of interventions, understandings of new ways of working together and identification of alternative governance structures. This thesis has shown that elements the ZW policy developed as a response to the problematisation of existing governance structures when adopting the waste as resource

perspective. Nevertheless, a gap was found between the goals of this new rationale and changing the practice of governance in Scotland. Taking direction from the idea of Governmentality for SD, it was suggested in section 6.4 (p199) that this gap could be reduced through the promotion of post-normal governance and the adoption of “strong transdisciplinary” ways of thinking.

As an output of the project, it is hoped that this thesis itself can promote the importance of transdisciplinarity for ZW policy. It was noted throughout the thesis that engagement with the academic community in Scotland’s ZW regime is limited, particularly in relation to social sciences. By linking the concept of ZW as applied in Scottish policy with academic debate, this thesis could encourage further socio-political research on waste in Scotland.

This thesis links to three different sets of literatures: waste, governmentality and Sustainability Science. The purpose of the literature reviews in Chapters 2, 3, 4 were not to identify gaps within the literature for this research but rather to use existing research to provide insight into the problem-focus of this thesis: the governance of ZW. Nevertheless, the most straightforward way to evaluate the salience of this project to academia, is to consider where this thesis contributes to the existing literature. The contributions can be seen through empirical, theoretical and methodological perspectives.

The most obvious contribution of this thesis to academic literature are the empirical insights on waste governance in Scotland. Chapter 2 noted that there have been no studies on waste governance in Scotland, and those which claim to investigate the UK have an English focus, despite England having an almost completely separate waste regime. Not only was this thesis the first step in providing an insight into the Scottish waste management system, but as one of the first countries to adopt a national ZW strategy, Scotland was also considered an ideal case to develop a more nuanced picture of ZW governance policies.

It was noted in Chapter 2 that no studies have considered a national ZW policy in a developed country. Similarly it was argued that ZW case studies have neither addressed potential nuances of the definition of ZW within their research domain, nor have

attempts been made to link the governance of ZW with more general understandings of waste governance. This thesis has shown that ZW can exhibit a range of characteristics within one policy regime (Section 5.2 p135) which complements existing findings from bibliometric reviews (Zaman, 2015). Zaman's work offers an overview of the ways in which ZW has been conceptualised within the literature which he concludes will help policy-makers identify "priority areas" to develop national ZW guidelines (p19). The findings in this thesis suggest that recognition of past conceptions of ZW may not prove sufficient in achieving this goal. The thesis argued that the practices which underpin the ideas of ZW are not necessarily predefined but instead reflect historic governance techniques as well as innovative policy interventions.

This finding relates more closely to the work on waste governance and the literature review in Chapter 2 exhibited that scales, actors and techniques interlink to create modes of waste governance. The chapter recognised that the research in waste governance is more advanced than ZW literature, but, limitations of this waste governance scholarship were also identified. Research was considered lacking by its primary focus on municipal waste and the limited application of socio-political concepts to understand waste governance. This thesis has also contributed to these areas by presenting a governmentality study of all waste within a national context. In this thesis the use of governmentality as a theory to make sense of the development of ZW policy has presented understandings of the link between the areas of knowledge, scales, actors and policy interventions, which have each individually be identified as important within waste governance literature.

This recognition of the importance of context is potential contribution to the theoretical literature which underpins this research. One of the critiques of the existing literature on governmentality for the environment and sustainable development was the failure to recognise the importance of both the problem-based and geographical context of study. This thesis has shown that there are particular elements of ZW which make direct comparison with rationales of governance for other environmental problems (i.e. climate change) or other locations difficult. As a consequence this thesis argues that studies engaged in identifying governmentalities for sustainable development should more readily take account of the location and type of the environmental problem. Moreover the thesis used methodological insights from governmentality studies

elsewhere (i.e. housing research and realist governmentality) to argue for the use of particular research data in constructing understandings of these contexts and problems. The identification of the importance of types of research data appears yet to have been considered in environmental governmentality studies.

The thesis has built further upon this practical guidance for environmental governmentality by presenting a methodology through which rationalities for existing governance practices and intervention points for future policy actions can be identified. The thesis argues that elements from multiple existing governmentalities can be used to explain existing practices within the policy regime without succumbing to the criticism of giving myopic attention to advanced-liberal explanations. This framing can then be used to identify elements of the policy regime which are not evident from the chosen existing governmentalities, this speaks to the contextual importance claims of Environmentalism. Finally the combination of these elements can be used to evaluate against the ideal of a Governmentality for SD. This structured approach to using governmentality links neatly with the goals of Sustainability Science to clarify problems and identify solutions.

As a consequence, the thesis also offers a two-fold contribution to Sustainability Science. Firstly it provides a structured methodology through which to make sense of complex governance systems, which links to Marsden's (2011:311) claim that Sustainability Science must find "innovative ways of combining stakeholders and experts at governance scales". The methodology outlined in Chapter 3 could be used to understand a variety of governance problems in a number of different locations. Secondly, the accompanying reflective account of the research process in Chapter 4 offers insight into the manageability of conducting a Sustainability Science project at PhD level and attempting to use a theory like governmentality to shed light on a real world problem.

Other research has suggested that current Sustainability Science projects have failed to produce the type of transformational knowledge that is an aspiration of this research: with focus of current studies placed on single "case-based solutions" (Wiek et al. 2012:22). Calls have also been made for Sustainability Science research that more actively engages with sustainability values on the basis that this will develop research

which is more transformational (Miller et al. 2014; Miller, 2015). Through its design of a process to identify Ecogovernmentalities, this thesis has created a framework which allows input from a multitude of perspectives whilst adapting to time constraints of actors, allowing investigation of national policy from a Sustainability Science perspective and contributing to “transformational” sustainability knowledge (Hopwood et al. 2005)

This section has argued that this thesis satisfies the normative goals of Sustainability Science to contribute to understandings of real world problems. The thesis has produced clarity on techniques of ZW governance, new perspectives on the objectives and rationales behind these techniques and made suggestions about future developments in both societal and academic approaches to ZW policy. However, for these ideas to gain traction amongst the society and academic communities, the findings of this thesis must have emerged through a respected process. As a consequence, the next and final subsection considers the legitimacy of this project.

7.3.3 Legitimacy

Legitimacy in Sustainability Science research is linked to societal and academic acceptance. Sustainability Science in adopting a pluralist technique is research that is not underpinned by a single disciplinary philosophy and in aiming to contribute to understandings of societal problems, inherently involves an element of normativity (Hadorn et al, 2006). As a consequence, it is necessary for the researcher to adopt a reflexive approach (Spangenberg, 2011). Reflexivity, along with transparency, is a component of many social science approaches to providing trust in the research (Miller et al. 2008; Saumore and Given, 2008). Chapter 4 of this thesis outlined in detail the process of data collection and analysis to provide an audit trail for an independent assessment of the research approach, which inherently included aspects of reflexivity.

In Chapter 4 it was suggested that Sustainability Science is both a normative and practical research strategy. This was the approach taken in this thesis where the goal of understanding ZW policy in Scotland played a key role in shaping the research design. This thesis contended that this approach requires “Methodological Pluralism” (Moses and Knutsen, 2012). It was argued that Methodological Pluralism links closely with the idea of transdisciplinarity.

As previous research has suggested, transdisciplinarity was found to be difficult to implement, particularly in a PhD project (Felt et al. 2013; Patterson et al. 2013) concerned with national policy. As a consequence this research embraced the values of a “strong transdisciplinary” approach (Max-Neef, 2005), taking in multiple perspectives and adopting a reflexive methodology that included both pragmatic and value-based questions, but adopting a research strategy was more *consulting* than *participatory* (see Chapter 4 p112).

The decision to adopt a *consulting* transdisciplinary approach was based on awareness that research participants lacked the time and, in some cases, inclination to adopt continual engagement in this type of research. This reflects research which suggests that continued engagement with elite participants can be difficult (Aberbach and Rockman, 2002) and that perceptions of scientific knowledge is barrier to transdisciplinary approaches (Elzinga, 2008). The thesis argues that this methodology was justified by considering the nature of the problem the project was trying to research (i.e. national waste policy in Scotland). Other researchers have argued that this justification links the epistemological approach to the research problem, making it compatible with Sustainability Science (Miller, et al. 2008).

Governmentality was identified as a concept which could shed light on practice of ZW governance both from a practical and value-based perspectives. In that this research project was driven by the aim of contributing to transitions towards more sustainable waste management, the concept of governmentality was used accordingly to not only identify underlying rationales behind practices of governance in the ZW policy in Scotland, but also to identify where and how those rationales could be developed to fall more in line with Governmentality for SD.

This transformational (and inherently normative) interpretation of governmentality may sit uncomfortably with many more traditional scholars of governmentality, however, this thesis found that the use of governmentality was a useful theory to make sense of a complex governance regime and provided scope for future research in this area. As explained in Chapter 4, one of the difficulties of research like Sustainability Science is

that it must bridge ontological divides between what exists and what might be, with the latter perspective suggesting that our current reality is a construction of particular ways of seeing the world. This thesis has shown that governmentality can be used as a bridging concept. In this sense, the theory has been used as a “meta-theory” (Geels, 2010:503) in which it has provided an “interplay” between various ontologies, identifying one type of knowledge (the material practices of ZW governance) but critically evaluating it in light of another (Governmentality for SD).

Whilst ontological and epistemological questions may be raised by academic stakeholders, these are likely to be of less concern to societal actors. The thesis has attempted to satisfy policy-makers of the legitimacy of this thesis by using recognised methods of data collection which were respectful of the research participants political positions. The data represents the views of experts from a variety of sources in the waste industry and so is well grounded in terms of breadth of perspective. Finally the purpose of the research to contribute to the enhancement of the ZW policy in practice is highlighted through the development of the research summary findings which has translated the main findings of the thesis into an accessible and brief document for policy-makers (Appendix 6 p281).

7.3.4 Governmentality as an Analytical Framing: Summing Up and Looking Forward

This chapter was intended to achieve the final aim of the thesis: to investigate governmentality as an analytical framing through which to understand the governance of ZW in Scotland. This section has used criteria identified in Sustainability Science to evaluate the findings, contributions and limitations of this thesis. As would be expected in any piece of research, there are methods that could have been improved, analysis that could have extended and ideas that could have been further explored, but a thesis is not a panacea and the potential critiques of the research design and findings have been explained and reflected upon throughout.

Nevertheless, this thesis contends that governmentality works as a framing through which to understanding the governance of ZW in Scotland. It found that governmentality can be used to identify goals and techniques of governance in ZW,

which clarify the use of ZW as a policy goal in a national context. It was also shown that governmentality can provide additional insight into ZW governance by presenting the rationales behind these goals and techniques and offering explanations as to how these rationales develop. Moreover, this thesis has shown that governmentality can be used as a framework through which to critically evaluate existing governance rationales in comparison to governmentality for SD.

This thesis found that using this framework also allowed the identification of points of intervention in the ZW policy in Scotland as part of a transition towards sustainability. This is an imperative objective for a Sustainability Science thesis which aims to be solution-oriented. As a consequence it is found that governmentality as used in this thesis is a useful framing through which to not only make sense of complex sustainable governance problems, but also to identify potential solutions.

Importantly for Sustainability Science, this thesis also contends that the methodology of governmentality used in this thesis permits the use of multiple forms of knowledge to shape the Framework for Analysis. It was found that both by extending the data collection beyond documents to included policy-maker perspectives this allowed more critical perspectives on the ZW policy to emerge, which again highlighted opportunities for actions to encourage sustainable transitions. As a consequence, this thesis maintains that future research that endeavours to use this methodology, should involve the input from a plurality of knowledge sources and should not rely on document analysis alone.

7.4 Future Research

The opportunities for future research from this project are wide and, clearly from a Sustainability Science perspective this future research should be driven from a societal need. On the other hand the research has identified gaps in existing empirical research on ZW and has also tested a new framing for governmentality studies, both of which could provide future research avenues within academia. A few of the many examples for future research opportunities are discussed in this section.

There are numerous opportunities for future governance research to contribute to understandings of Scottish ZW policy, not least because there is no published socio-

political research on Scotland's waste. It would be interesting to learn and differentiate between approaches from different local authorities. This comparative research would have the added incentive of shedding light on the consequences of existing infrastructure in shaping waste governance. Comparative approaches could also be used to analyse the approaches of the ZW voluntary groups. These organisations have all adopted slightly different business models (i.e. charities, social enterprises, community interest companies) and provide an ideal comparator to address the question of how business models affect understanding and implementation of ZW goals: a question that was raised by a number of interviewees.

Beyond comparison, future research could clarify the understanding of ZW within different groups involved in the policy, particularly the roles of boundary organisations and those working at the interface between policy and practice. This research project has focused on actors within the policy arena, but both ZW and governmentality theory would call for a wider dissemination of the policy to achieve the policy goals. Organisation based research could shed light on how the goal of ZW is conceived and acted upon outside the policy arena, similarly further research could consider the conceptualisation of the idea amongst the general public. ZW research has predominantly focused on the application of policies at a government (regional and local) level, less research has considered the effect of these policies on other actors in the system and yet waste research has noted that policies can be interpreted very differently at local levels.

The applications of the analytical framework could also be expanded and from a governmentality for SD perspective, the methodology could be used on ZW projects in other locations or to other SD problems in Scotland. The limited research available has shown that there is some commonality in the governance approach of Scotland (Raco, 2003; Russell and Thomson, 2012). A more comparative study of governmentalities that emerge through different policy programmes would highlight whether it is the problem-based focus of ZW that encourages the governance practices that have been presented in this thesis, or whether it is a Scottish approach to governance. Consideration of other Scottish policies would also show to what extent more advanced-liberal governmentalities predominate, potentially overshadowing the resource-focus aspects of the ZW policy. In addition more could be made of the alternative elements of

the Governmentality for SD, with a focus placed upon ecological economics or systems-thinking. This focus could consider – as this thesis has with post-normal science – whether promotion of these elements would facilitate the shift from waste as disposal to waste as a resource.

The options for future research go beyond those mentioned here, and it is perhaps worth remembering the requirements for the scope of ZW outlined in Chapter 5 (p145) where it was argued that to be successful the policy must cross policy boundaries and scales. This thesis has shown that the concept of ZW can problematise existing governance practices and so, the expansion of ZW research (particularly in an empirical setting) could potentially provide a critical window through which to understand other policies and their effect on waste.

7.5 Concluding Thoughts

“In writing a problem down or airing it in conversation, we let its essential aspects emerge. And, by knowing its character, we remove, if not the problem itself, then its secondary, aggravating characteristics of confusion, displacement and surprise.”

(de Botton in Dunleavy, 2003:1)

This thesis began by highlighting a global crisis of resources. It was driven by the belief that modern practices of consumption and disposal have grave consequences for the environment, society and now our economy. The idea of ZW was offered as an potential antidote to this global problem of wastefulness. This thesis has explored the use of ZW in a policy context in Scotland, attempting to uncover what this concept means, whether it should be promoted and how it might change the way society thinks about resources.

The thesis has concluded that the ZW policy needs more active engagement with socio-political ways of knowing to build an understanding of the rationales and values behind the policy and where these values and rationales clash. Coming from a social science perspective, it could argued that this conclusion is self-serving, however, this thesis has also been careful to note that critical engagement with governance practice is not a panacea to the problem of waste in Scotland. On the other hand, socio-political

perspectives could provide useful knowledge for the policy: with the calls for greater insight into governance practices emerging from within the ZW regime as well as this thesis.

The thesis claims that wider discussion on the values which underpin the ZW policy in Scotland is needed. It was argued that a strong transdisciplinarity in ZW would help identify values inherent in the policy; provide new perspectives on current actions; and encourage a wider participation in waste management discussions. The thesis recognised that the goal of strong transdisciplinarity could be promoted through post-normal technologies which opened up consideration of waste policy to extended peer communities, agonistic processes and ecological citizenship. For these technologies to succeed, waste management and policy-making must be made more transparent.

The thesis has provided clarity on the actors and techniques operating in ZW policy in Scotland. It has presented how the objectives of ZW are understood in Scotland. It has also provided insight into the rationalities behind these techniques and objectives. In this sense, this thesis presents a first step in creating a map through which critical academic engagement with waste policy in Scotland can be developed. It is hoped that this will encourage others to engage with waste governance in Scotland, expanding perspectives, creating new ideas and opening up discussions beyond the technical management of waste.

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Appendix 1: Participant Information, Consent Forms & Ethical Approval

Research Summary

Title: A study of stakeholder understandings of Zero Waste in Scotland

Objective:

To develop a map of issues, actors and understandings of the concept and management of Zero Waste in Scotland.

Your involvement:

As an identified key individual in the Zero Waste Scotland Regime, I would like to discuss with you:

- How you would describe Zero Waste Scotland?
- Who you feel are the key actors in the current regime?
- How can Scotland best achieve its Zero Waste targets?
- What do you think are the current issues facing the Zero Waste Scotland targets?

How this information will be collected and used:

The conversation will not follow a formal interview structure. I will keep notes during our discussion and this information will be used to help me shape the next part of my project. The data will be coded (see attached consent form for details) and data will be kept until the completion of my PhD but for no more than 3 years.

In the second part of my project I will be conducting more formal short interviews on the understanding and implementation of Zero Waste targets in Scotland. The content and participants of the interviews will be shaped by my discussions with you and other key individuals.

Anonymity:

The notes from our discussion may be referred to in my thesis. I will not attribute any comments directly to you, however, the data from our discussion may be shared with my supervisors: Professor Jan Bebbington and Dr Samuel Mansell. Moreover, as I intend to interview a number of people who are closely associated with the Zero Waste project in Scotland, other participants may be able to identify you or your organisation from your responses.

If you have any questions about what the interview will involve, or how the data will be used, I will be happy to discuss this with you.

Contact Details: Researcher: Lucy Anderson (La24@st-andrews.ac.uk)

Participant Consent Form

Project Title: A study of stakeholder understandings of Zero Waste in Scotland

Researcher(s) Name(s)

Lucy Anderson
(la24@st-andrews.ac.uk)
School of Management
University of St Andrews

Supervisors Names

Professor Jan Bebbington
(kjb10@st-andrews.ac.uk)
Dr Samuel Mansell
(sfm5@st-andrews.ac.uk)

The University of St Andrews attaches high priority to the ethical conduct of research. We therefore ask you to consider the following points before signing this form. Your signature confirms that you are happy to participate in the study.

What is Coded Data?

The term 'Coded Data' refers to when data collected by the researcher is identifiable as belonging to a particular participant but is kept with personal identifiers removed. The researcher(s) retain a 'key' to the coded data which allows individual participants to be re-connected with their data at a later date. The un-coded data is kept confidential to the researcher and Supervisors.

Consent

The purpose of this form is to ensure that you are willing to take part in this study and to let you understand what it entails. Signing this form does not commit you to anything you do not wish to do and you are free to withdraw at any stage.

Material gathered during this research will be coded and kept confidentially by the researcher with only the researcher and supervisor having access. It will be securely stored on a personal laptop and external hard drive, both of which are password protected. The data will be destroyed within 3 years of this date.

Please answer each statement concerning the collection and use of the research data.

- | | | |
|---|------------------------------|-----------------------------|
| I have read and understood the information sheet. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I have been given the opportunity to ask questions about the study. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I have had my questions answered satisfactorily. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I understand that I can withdraw from the study at any time without having to give an explanation. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I understand that my data will be confidential and that it will contain identifiable personal data but that will be stored with personal identifiers removed by the researcher and that only the researcher/supervisor will be able to decode this information as and when necessary. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I understand that my data will be stored for a period of up to 3 years before being destroyed | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I have been made fully aware of the potential risks associated with this research and am satisfied with the information provided. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| I agree to take part in the study | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Participation in this research is completely voluntary and your consent is required before you can participate in this research. If you decide at a later date that data should be destroyed we will honour your request in writing.

Name in Block Capitals _____

Signature _____

Date _____



2 November 2012
Lucy Anderson
School of Management

Ethics Reference No: <i>Please quote this ref on all correspondence</i>	MN9271
Project Title:	The Role of Law in the Normalisation of Zero Waste in Scotland (Part 1 of PhD Research)
Researchers Name(s):	Lucy Anderson
Supervisor(s):	Professor Jan Bebbington, Dr Sam Mansell

Thank you for submitting your application which was considered by the School of Management's Ethics Committee. The following documents were reviewed:

1. Ethical Application Form
 2. Research Summary
 3. Participant Consent Form
- 20 September 2012

The University Teaching and Research Ethics Committee (UTREC) approves this study from an ethical point of view. Please note that where approval is given by a School Ethics Committee that committee is part of UTREC and is delegated to act for UTREC.

Approval is given for three years. Projects, which have not commenced within two years of original approval, must be re-submitted to your School Ethics Committee.

You must inform your School Ethics Committee when the research has been completed. If you are unable to complete your research within the 3 three year validation period, you will be required to write to your School Ethics Committee and to UTREC (where approval was given by UTREC) to request an extension or you will need to re-apply.

Any serious adverse events or significant change which occurs in connection with this study and/or which may alter its ethical consideration, must be reported immediately to the School Ethics Committee, and an Ethical Amendment Form submitted where appropriate.

Approval is given on the understanding that the 'Guidelines for Ethical Research Practice' (<http://www.st-andrews.ac.uk/media/UTRECguidelines%20Feb%2008.pdf>) are adhered to.

Yours sincerely

Dr Philip Roscoe
Convenor of the School Ethics Committee

cc Shona Deigman

Appendix 2: Interview Guide

1. Understandings of Zero Waste

Key Topics to discuss: waste (negative/positive); Zero Waste; development of knowledge; rationale for Zero Waste (normative/practical etc.), process/goal (circular economy vs end of pipe)

Key Questions:

- What do you understand as waste?
- What is your understanding of Zero Waste?
- When did you first hear of the concept of Zero Waste?
- (Have your perceptions of Zero Waste changed?)
- Do you think the government goal of Zero Waste is important? Why/why not?
- Are the government's goals for Zero Waste realistic? Why/why not?

2. Key actors and networks in Zero Waste

Key Topics to discuss: Zero Waste Scotland/SEPA/Scottish Government; Consultations; different sectors; interviewee's role; UK vs Scotland vs EU.

Key Questions:

- How have you developed your knowledge on Zero Waste?
- How do you think your clients/members etc understand Zero Waste?
- How do you keep up to date on Zero Waste?
- Is there any group/sector that you think have a specific interest in Zero Waste?
- Who do you think is responsible for i) education ii) implementing iii) enforcing Zero Waste goals in Scotland?
- Do you think there is a common goal of Zero Waste in Scotland?
- Have you read any of the consultation responses on Zero Waste? From who?
- What are your thoughts on Zero Waste Scotland?

3. Practicalities of Zero Waste

Key Topics: legislative changes; waste hierarchy; communication strategies; responsibilities (organisations/sectors/local authorities); incentives; useful instruments for analysis

Key Questions:

- What are your thoughts on recent legislative changes?
- At what stage do you see Zero Waste being most pertinent? (design; resource efficiency; revising products; preventing waste; recovering value from products)
- Do you think the waste hierarchy is a useful framing?
- How would/do you encourage your members to achieve Zero Waste?
- Do you think there are any areas which are currently being neglected?
- Do you have any examples of industries/companies/sectors/ organisations that are performing well?
- What more information/research do we need to achieve Zero Waste?

Appendix 3: Framework of Analysis and Guide

Overarching Rational of Guide

This guide is designed to act as an aide memoire as to the rational behind the analysis framework for the researcher and as a statement of clarification of the specific approach taken, in this study, to construct the components required for Dean's Analytics of Government.

Where possible the analysis will take the direct responses from interviewees in an effort not to alter the data with researcher interpretation. Nevertheless, it is thought that each section for analysis requires some form of researcher interpretation, not least because each interview was slightly different; the interviews were semi-structured they varied in length, dynamic and practical matters which are noted issues with "elite interviews" (Marshall and Rossman, 2006:105). The interviewees were able to commit from 25 minutes to 90 minutes depending on schedules based on personal commitments and as such opportunities for development of answers varied. It has been noted that Sustainable Science needs to find "innovated ways of combining stakeholders and experts at different governance scales" (Marsden, 2011:310) a problem which this framework for analysis is attempting to overcome.

That said, where the framework encourages a more interpretative angle, this has been supported by using findings from other academic studies on similar topics to further support the researcher interpretation. As a consequence all sections will be analysed from a deductive and inductive standpoint. The guide (and analysis) uses Gouldson and Bebbington's (2007) simplified interpretation of Dean's Analytics of Governance and, therefore, separates analysis into 6 elements, it should be noted that each component is not mutually exclusive.

Element 1: Identification of Problematisations

For Dean (1999:27) Analytics of Government begins with identification of "the specific situation in which the activity of government comes into question". These situations he calls "problematisations" (ibid). Waste represents a problem for society through a number of manifestations, as such, of all the components of Analytics of Governance undertaken in this analysis, identification of Problematisations requires the most

researcher interpretation. This is, in part, attributable to Lehmann's (2011:157) observation that waste is an issue "transcends boundaries and disciplines", therefore it lacks a consistent vocabulary. It also reflects the reality that many interviewees were not asked explicitly why they thought we needed a Zero Waste policy. The reason for this was two-fold: firstly it was the interviewers experience that this question often set a very basic tone for the rest of the interview (with the interviewees assuming a low level of knowledge) and secondly because other interviewees chose to begin with their own notes which covered the topic but left little for explicit questioning.

It is recognised that there may be crossover within categories and that different interviewees may use alternative terms. The purpose is not to develop a detailed examination of how waste is problematised by each individual interviewee but instead to produce a more nuanced understanding of why waste (or Zero Waste) is an area for concern in Scotland. It is expected that most problematisations will be identifiable in each interview in one form or another, but consideration will be given to the number of interviews which discuss a certain problematisation and the importance given to them by each interviewee.

1. A review of academic literature on waste governance has identified 7 problematisations of waste which are indicated in Section 1 of the Attached Framework. Each interview will be considered for the presence of these categories.
2. In addition a further 'other category' has been added. This is to supplement the deductive analysis based on the waste literature review. In this category any other problematisations of waste identified within each interview will be added. This purpose of this is two-fold i) it supports the sustainability science approach to problem identification as a collaborative effort between researchers and practitioners and ii) it allows the identification of 'waste' itself as a problem. This latter point is particularly important for this study on Zero Waste. Scanlon (2005:14) notes that "there is no 'social theory' or concept of garbage at all" as a consequence that which is discarded only becomes a concern when it links with another societal problem. The limited social commentaries on Zero Waste suggest that it has the potential to refocus the concern on the discarding itself, rather than its link to an identifiable wide problem.

Element 2: Fields of Visibility

Frame and Russell (2010:202) describe visibilities as “the ways in which certain things are made visible from governing activities while others are not”. It is arguably more problematic to identify visibilities from semi-structured interviews than from documentary analysis, not least because in many circumstances the interviewees are directly to specifically consider a topic. The interviews will be analysed in three ways to establish the visibilities (as indicated in Section 2 of the Attached Framework).

1. Firstly, in recognition that visibilities are closely linked to techniques and practices, attention will be paid to the impacts (intended goals), targets (set benchmarks) and measurables (statistics) explicitly mentioned in each interview. This approach aims to identify those areas that are at the forefront of interviewees concerns and will allow a consideration of what the regime considers important. Understanding key areas of concern also helps identify those areas which might be excluded from consideration by the regime of government.
2. As a consequence, and in connection to the Sustainability Science approach, interviewees were asked explicitly for their opinion on areas within the regime that were currently neglected and issues upon which more research and knowledge was required. Answers to these questions will be noted in ‘Exclusions of Waste’ in Section 2 of the Attached Framework. Much of academic waste work is centred on discard and, whilst admittedly important in any governmentality study, it seems particularly necessary to consider the excluded in a study of Zero Waste. Reflecting the close link between components, this question is also analysed in relation to Component 4: Knowledge.
3. Finally Russell and Thomson (2009:232), building on the work of Oels (2005), identify specific spheres of visibility within ecological governmentalities including: population; individual and social groups; new markets; holistic ecosystems; global and local communities. Both Oels (2005) and Russell and Thomson (2009) have categorised visibilities in terms of existing governmentalities i.e. Green Governmentality; Ecological Modernity and Sustainable Development. In order to avoid limiting analysis to these forms of governmentality, for the purposes of this project, these visibilities have been reclassified into geography; communities of interest and environment (see

attached table). These classifications were chosen as being broad enough to encompass all of the visibilities identified by Russell and Thomson (ibid: 237) within current Scottish Government Sustainable Development policies without rigidly adhering to the list of visibilities identified by their work.

Element 3: Technologies of Government

Dean (1991:31) describes the technical aspects of government as “means, mechanisms, procedures, instruments, tactics, techniques, technologies and vocabularies”. Technologies is the arguably the area within governmentality which has had the most attention and so the table for analysis is more detailed. Section 3 of the Attached Framework outlines how each identified technology will be analysed. It is recognised that not all technologies will be discussed in sufficient detail in each interview to allow for the completion of each section. It is hoped that conglomeration of the interview and documentary analysis will allow for this at a later stage. Interviews will be first analysed subjectively and then will undergo a secondary analysis against the list of policy instruments for sustainable waste management identified by Finnveden et al. (2013).

1. Part 3a of the attached Framework classifies the techniques as Statutory; Surveillance; Statistics or Market based. These categories are largely linked to the ideas of sovereign, bio and liberal power and feature in most governmentality analyses (albeit with different titles).
2. Part 3b of the attached Framework classifies techniques as technologies of Performance (benchmarks and targets), Agency (relationships and contracts between parties) and Citizenship (participatory techniques). This is based on the work of Russell and Frame (2013) where these types of technology are identified within sustainable water policies in Scotland and New Zealand.
3. Part 3c of the attached Framework uses the work of Bulkeley, Watson and Hudson (2007) who identify Disposal; Diversion; Eco-Efficiency and Waste as a Resource as the main modes of governance within Municipal Waste Management in England.
4. Part 3d of the attached Framework identifies whether the technique is focused on a Global, National or Local level. This is to reflect the finding of Backstrand and Lovbrand (2006) that suggest ecological governmentality manifests in different ways at different levels.

5. Finally Part 3f of the attached Framework will be used to identify links to Sustainable Development Governance Techniques as identified by Frame and Bebbington (2012). These include ecological footprints; precautionary principal; environmental citizenship; networking and foresight; using notions of wellbeing and justice (p266).

Element 4: Knowledge

Dean (1999:33) considers the understanding “the approach to Government as rational and thoughtful activity” as central to illuminating the governmentality of a regime. This is closely linked to disciplinary power and as a consequence it is thought necessary to identify the disciplines which are valued within the Zero Waste Regime. As the links between knowledge and power are considered a fundamental tenet of Foucault’s work and a strong component of Sustainability Science, this section will be analysed in depth and from various standpoints. As with previous component analysis will be both deductive and inductive. Interviews were first analysed subjectively and then re-examined using the list of forms of knowledge outlined by Russell and Thomson (2009).

1. In his article on Transdisciplinarity Max-Neef identifies that disciplines occur on 4 levels: the empirical level (basic science); practical level (applied science); normative level (eg politics); and values level (philosophy). These have been translated into Part 1 of attached table. Russell and Thomson (2009:232) identify transdisciplinarity as knowledge for sustainable development governmentality. It is hoped that classification through Section 4a of the attached Framework will help identify the extent to which transdisciplinarity is occurring.
2. Similarly Section 4b identifies ‘Ways of Knowing’ to offer further clarification on the types of knowledge that are deemed useful and appropriate in Zero Waste Governance. This will be used to note different approaches to gaining knowledge (i.e. for example comparisons or statistical analysis). This is based on the work of Moses and Knutsen (2012) and is used to reflect the realisation that whilst it might not be possible to identify the disciplines preferred by the interviewee (Part 1 of the table), it may be possible to identify the type of approach the interview prefers to knowledge creation.
3. It is recognised that both Sections 4a and 4b of the Framework are interpretative and so Section 4c is to note any explicit reference from the interviewee

concerning his/her own knowledge, whilst Section 4f of the Framework identifies any direct reference to Acronyms (taken as an example of expert knowledge).

4. Further to this, 4d and 4e of the Framework take direct answers to specific questions. Interviewees were asked what further research was needed and if they were undertaking research in this area who they would speak to. This latter question (Section 4e) will feed back into the 'Identities' section of analysis.
5. Section 4g of the table explicitly links to the types of knowledge considered important for sustainable solutions and may be seen as analogous with the inputs required for Mode 2 knowledge (Gibbons et al. 1994). This part of the table will include both explicit and interpreted aspects of the interview.

Element 5: Identity

Dean (1999:32) suggests that an analysis of governance must consider who “exercises authority” and who is “expected to be governed”. As a consequence this component of analysis does not focus heavily on the identify of the interviewee. As with identified technologies, it is not expected that all information on each ‘Identity’ will be available in every interview. Again analysis has been both interpretative and taken from explicit answers.

Unlike with the analysis of previous components, there is no clear previous analysis or literature on identities in waste governance. As a consequence interviews will not be analysed in relation to an external source. Nevertheless interviewees were explicitly asked who should be contacted for further insight into this area, this was taken of some indication as to the important identities within waste governance.

1. Section 5a of the attached Framework seeks to identify whether the identity is classified as waste (i.e. CIWM) or non-waste specific (i.e SEPA). This distinction is made in order to highlight whether there is a difference between identities with governmentality for waste and governmentality for sustainable development
2. Section 5b is based on the work of Oels (2005) which highlight different levels of identity within different governmentalities present in the climate change regime. These are similar to those found by Bäckstrand and Lövbrand (2006) in their review of climate change mitigation policies.

3. Section 5c of the Framework considers whether the identity has legal personality. This information is taken entirely from the Researchers own expert knowledge and does not reflect the understanding necessarily of the interviewee.
4. Similarly Section 5d inquires as to whether the identity in question is of future or current generation. Frame and Bebbington (2012) note the importance of inter and intragenerational identities for the sustainable development governmentality.
5. Sections 5e and 5f of the table more explicitly reflect the views of the interviewee and relate directly to the question of the responsibilities of particular organisations and their engagement with that organisation. This information is not available for all identities; in some instances interviewees were encouraged to discuss particular bodies if they were not forthcoming in their discussions of responsibilities for Zero Waste in Scotland.

Element 6: Utopia

For Dean (1999), extracting the utopian element behind rationales of governance allows us to extrapolate not only how societies are managed but also how we envisage the means better future. This, he argues, is a key basis for many theories of government. Zero Waste in itself is an explicit and recognised utopia: as Davies (2008:14) notes in her work on garbage governance, Zero Waste is a “movement” that “demands a transition” from the current system. As a consequence all interviewees were explicitly asked what Zero Waste meant to them.

1. Part 1 of Table 6 allows for collection of their specific response to the question of ‘What is Zero Waste?’
2. Frame and Bebbington’s (2012) paper on governmentality for sustainable development notes that “there are many utopian visions of a more sustainable world” (2012:267) and sustainability is widely noted for its diversification of meaning (e.g. Hopwood et al. 2005). It is considered that review of the interviews based on the extensive literature of sustainable development futures would be too complicated and lacking legitimacy and so the data on utopian elements is based largely on the 3 separate spheres rather than an overarching vision for sustainability.

1. Problematisation						
Health Problem						
Public Nuisance						
Environmental Pollution						
Criminality						
Social Justice Issue						
Resource Conservation						
Sustainable Development						
Other						
2. Visibilities						
Impacts		Targets			Measurable	
Exclusions of Waste						
Geography		Communities of Interest			Environment	
3. Technology						
Statute	Surveillance	Statistics	Market	Technologies of Performance	Technologies of Agency	Technologies of Citizenship
Disposal		Diversion		Eco-Efficiency	Waste as a Resource	
SD Links:					Global	

		National
		Local
4. Knowledge		
What Exists?		
What are we capable of doing?		
What is it that we want to do?		
Why should we want that?		
Ways of Knowing (2)	More Knowledge Needed (3)	Personal Knowledge (4)
		Types of People I need to speak to (5)
Acronyms		
Expert Knowledge	Common Sense	Academic/Research
Interdisciplinary		
Policy Based Knowledge		
5.Identity		
Identity:		Individual
		Collective
Waste	Non – Waste	National
Legal Status:		Responsibilities:
Generation:		
Engagement:		
6. Utopia		
Zero Waste		
Economic	Social	Environmental

Appendix 4: Revised Framework of Analysis and Guide

Overarching Rationale of Guide

This guide is designed to act as an aide memoire as to the rational behind the revised analysis framework for the researcher and as a statement of clarification of the specific approach taken, in this study, to construct the components required for Dean's (1999) Analytics of Government. It should be noted that whilst many other studies have used Dean's approach, none (including Dean himself) have given very specific guidance as to how the particular components in his framework for analysis have been taken from the data.

This guide complements the content of Framework of Analysis and Guide' which was used to analyse 30 interviewees in order to build a stakeholder understanding of Zero Waste. The original guide used codes which were based heavily on understanding from existing literature, this subsequent guide uses insight from the interview analysis to further shape the framework for analysis. The purpose of this is to reflect the transdisciplinary goals of this sustainability science thesis.

Unlike with the interview data – where the purpose was not to analysis verbatim the discourse of the interviewees but rather to construct a general understanding of zero waste governance – the documents were quoted directly. Documents were analysed as a resource i.e. 'what is in the document?' and 'how is it used?' (Prior, 2011:95) rather than a representation of an individual or groups views.

Element 1: Identification of Problematisations

It was suggested in the previous guide that Problematisation is the component that requires the most researcher interpretation. This was a reflection that waste is an issue that transcends disciplines and categorisation, it also highlights that there are no existing histories of waste in Scotland.

The original guide codified problematisations into 7 categories (see Figure 1). These codes were later amended with sustainable development being amended to economic development. This reflects the finding that zero waste is often associated with but not necessarily intrinsically linked with sustainable development, interviewees would

discuss zero waste in relation to the economic benefits that could be increased through resource efficiency but they did not necessarily connect these economic benefits with the environmental goals of sustainable development. It was, therefore, deemed necessary to have a separate categorisation for economic problematisation.

Similarly it was recognised that sustainable development was too broad a code which meant that the researcher often used it synonymously with ‘other’. As a consequence sustainable development was further broken down into boundaries of knowledge: in recognition that interviewees suggested zero waste brought to the fore the limitations of current research on waste management; limitations of current institutions: a reflection of interviewees frustrations at the lack of cross-policy engagement and long-term thinking in current political institutions; and ambiguous objectives: an acknowledgement by interviewees that zero waste goals were often juxtaposed against economic growth pursuits and increased consumption.

Figure 1: Original Problematisation Codes	Figure 2: Reframed Problematisation Codes
Health Problem	Health
Public Nuisance	Public Nuisance
Environmental Pollution	Environmental Pollution
Criminality	Criminality
Social Justice Issue	Social Justice Issue
Resource Conservation	Resource Conservation
Sustainable Development	Economic Development
Other	Boundaries of Knowledge
	Limitations of Current Institutions
	Ambiguous Objectives

Element 2: Fields of Visibility

In the original analysis visibilities were highlighted in relation to impacts (intended goals), targets (set benchmarks) and measurables (statistics) explicitly mentioned in each interview (Figure 3). This approach aims to identify those areas that are at the forefront of interviewees concerns and will allow a consideration of what the regime considers important. These have been amended in the second framework for analysis to

‘waste measures’ and ‘non-waste measures’ (Figure 4). It was found in the interviews that discussions of targets rarely moved beyond ‘the zero waste target’ of 70% recycling and only 5% to landfill. Equally, interviewees were reluctant to discuss goals and where they did it was easier to identify in terms of utopian expectations.

In contrast, whilst this particular set of coding was deemed too detailed, the second set of visibility coding which was based on the work of Russell and Thomson (2009) was considered too broad. Interviews were originally analysed within ‘geographic’, ‘communities of interest’ and ‘environmental codes’ (Figure 3) but this gave a large quantity of diverse data responses. As a consequence codes were redeveloped into ‘places’, ‘groups’ and ‘environment’. Each of these were subdivided into further codes (Figure 4). Examples of the most popular entries under these codes can be seen in Annex 1 to this document.

Within the places category, note was taken of the ‘Local Authorities’ mentioned, it is considered that this category gives good insight into the issues that are deemed particular important for zero waste governance in Scotland; for example Fife is mentioned regularly, arguably because it has one of the highest recycling rates of any local authority. Similarly notes of other ‘Countries’ for comparison was also considered an important category. ‘Waste Infrastructure’ was identified as a key area for development by the interviewees, consideration of the types of infrastructure could help highlight the understandings of zero waste in Scotland. Equally identification of where in the ‘Production- Consumption Cycle’ discussion was centred, allows interpretation of the importance of the closed-loop system versus a more traditional waste management approach. On a similar argument ‘Other Places’ extends visibility beyond end of pipe infrastructure and was considered as offering insightful information, particularly with regard to problematisation of zero waste.

The category ‘communities of interest’ was also expanded with codes including ‘Private Sector’ (designed to see what kind of business was important to zero waste) ‘public groups’ (to highlight important stakeholders), ‘elected bodies’ (which indicated scale), research groups (gave insight into knowledge production), ‘waste industry’ (provided details on the approved treatment of waste) and finally ‘third sector’ (which offered alternative perspectives on the goals of zero waste).

Finally ‘environment’ was subdivided into ‘ecology’, ‘energy’, ‘resources’ and ‘global’ and ‘local problems’. Again these categorisations were deemed useful in determining scale but also in relation to identification of the problematisation of zero waste.

The category exclusions of waste was removed for data analysis of the documents. Individual interviewees were asked explicitly for their opinion on areas within the regime that were currently neglected, the same cannot be done for documents. Moreover if an issue is contained within a document, it is arguably no longer excluded.

Figure 3: Original Visibility Codes	Figure 4: Reframed Visibility Codes
Impacts	Waste Measures
Targets	Other Measures
Measurables	
Geography	Places <ul style="list-style-type: none"> • Waste Infrastructure • Local Authorities • Countries • Other Spaces • Production Consumption Cycles
Communities of Interest	Groups <ul style="list-style-type: none"> • Private Sector • Research Groups • Third Sector • Public Groups • Elected Bodies • Waste Industry
Environment	Enviroment <ul style="list-style-type: none"> • Ecology • Energy • Resources • Local Problems • Global Problems
Exclusions of Waste	

Element 3: Technologies of Government

In the first framework for analysis technologies was thought the arguably the area within governmentality literature which has had the most attention and so the table for analysis is more detailed. Coding was developed on whether the techniques were ‘statutory, surveillance, statistics or market based’; linked to ‘performance, agency or citizenship’, associated with ‘disposal, diversion, eco-efficiency and waste as a resource’ (Figure 5).

Figure 5: Original Technology Table						
Technology:						
Statute	Surveillance	Statistics	Market	Technologies of Performance	Technologies of Agency	Technologies of Citizenship
Disposal		Diversion		Eco-Efficiency		Waste as a Resource
SD Links:					Global	
					National	
					Local	

It was very difficult to collect data on each of these components for in most interviews, the techniques were not described in detail or, instead, potentially covered a number of these classifications. Instead notes were taken of techniques with further detailed but uncoded descriptions. These were then codified into 11 different categories (Figure 6). Examples of the most common occurrences within these codes can be found in Annex 2 to this document.

Figure 6. Reframed Technology Codes	Justifications for codes
Fiscal Measures	<i>Allows identification of whether market based or government intervention leading to identification of Ecogovernmentalities (echoing the work of Oels,2005:200) .</i>
Legal Measures	<i>Type of legal measure can help identify governmentality in relation to technologies of performance, agency and citizenship (Russell and Frame, 2013: 98-99)</i>
Monitoring and Tracking	<i>Type of monitoring and tracking can help identify governmentality in relation to technologies of performance, agency and citizenship (Russell and Frame, 2013: 98-99). It can also highlight which types of knowledge are given credence and</i>

	<i>whether transdisciplinary is present (Russell and Thomson, 2009).</i>
Objective Setting	<i>Can be useful to identify stakeholders involved in objective setting and where and what level these objectives are discussed. Common objectives have also been identified as a key component of sustainable waste management in literature (Costa et al. 2010)</i>
Networking	<i>Is a key component of sustainable development governmentality (Frame and Bebbington, 2013)</i>
Infrastructure and Planning	<i>Allows insight into the stakeholders involved in zero waste governance decisions but also identifies focus for the production-consumption cycle. Davies (2008) found that relationships between stakeholders at a community level are important in shaping the context of national discussions.</i>
Business Solutions	<i>Considers the type of business development required for zero waste which can be connected to the work for Frame and Bebbington (2013) and governmentality for sustainable development.</i>
Advice and Education	<i>Identifies the type of knowledge that is deemed important for zero waste. A number of different studies have suggested a range of knowledge is necessary for sustainable waste management (i.e.Davoudi and Evans, 2005)</i>
Changing the Narrative	<i>Shows the critical engagement of stakeholders – something that has yet to be discussed at length in relation to governmentality.</i>
Collection	<i>Identifies focus for the production-consumption cycle central to identification of the modes of waste governance as outlined by Bulkeley et al. (2007).</i>

Element 4: Knowledge

In the previous guide it was suggested that as ‘the links between knowledge and power are considered a fundamental tenet of Foucault’s work and a strong component of Sustainability Science, this section will be analysed in depth and from various standpoints’. It was found that the existing framework for analysis (Figure 7) worked well with the knowledge component: it was pitched at an appropriate level of depth and offered clear but no necessarily obvious insights into the role and type of knowledge within zero waste governance.

As a consequence, the revised framework keeps the Max-Neef (2005) Transdisciplinary outline of (basic science); practical level (applied science); normative level (eg politics); and values level (philosophy). Similarly it also leaves space for ‘Ways of Knowing’ and ‘More Knowledge Needed’. Conversely it omits ‘personal knowledge’ and ‘knowledge of who I need to speak to’ because these are only applicable to the interview data where interviewees were asked these direct questions.

Equally the sources of knowledge were also considered useful codes through which to understand the development of particular forms of knowledge, with one addition: documents was added a 6th code in this category (Figure 8). It became apparent in the interview that not all guidance emerged from policy, nor from regulation but rather from more ad hoc guides and reports. Some of my interviewees suggested the published nature of these reports – as well as their authors i.e. SEPA- rendered them very influential.

Figure 7: Original Knowledge Codes
Max-Neef Transdisciplinary <ul style="list-style-type: none"> • What exists? • What are we capable of doing? • What do we want to do? • Why do we want to do that?
Ways of Knowing
More Knowledge Needed
Personal Knowledge
Types of People I need to Speak to
Sources of Knowledge <ul style="list-style-type: none"> • Expert • Common Sense • Research • Interdisciplinary • Policy Based

Figure 8: Reframed Knowledge Codes
Max-Neef Transdisciplinary <ul style="list-style-type: none"> • What exists? • What are we capable of doing? • What do we want to do? • Why do we want to do that?
Ways of Knowing
More Knowledge Needed
Sources of Knowledge <ul style="list-style-type: none"> • Expert • Common Sense • Research • Interdisciplinary • Policy Based • Documents

Element 5: Identity

As with techniques it was found that the existing framework for analysis (Figure 9) was too complicated to accurately depict identities. It was found that identities were not

described in detail or, instead, potentially covered a number of these classifications. In the original framework it was expected that not all information on each ‘Identity’ will be available in every interview. However, the information was deemed too sporadic to make it useful.

Figure 9: Original Identity Codes		
Identity:		Individual
		Collective
Waste	Non – Waste	National
Legal Status:		Responsibilities:
Generation		
Engagement		

Instead, like with technologies, information was taken on type and description of identities present in each interview. These identities were then coded into 10 different categories (Figure 10). Examples of the entries in these codes can be seen in Annex 3 to this paper.

Figure 10. Reframed Identity Codes	<i>Further explanation</i>
Politicians	<i>Those who create and make policy</i>
Ethical Actors	<i>Those who are participating in the process for reasons other than financial benefit</i>
Statutory Roles	<i>Those who are legally required to participate in the process</i>
Financial Beneficiaries	<i>Those who look to the financial benefit of the policy</i>
Opinions on Zero Waste	<i>Those who agree and disagree with the concept of zero waste</i>
Thinkers	<i>Critical opinions on zero waste policy</i>
Leaders	<i>Those who develop ideas to reach zero waste objectives</i>
General Public	<i>Those who do not have a defined role in relation to the policy</i>
Practical People	<i>Those who have experience of working in the area</i>
Confusion	<i>Groups who are confused by zero waste</i>

Element 6: Utopia

As with the original framework for analysis (Figure 11) which began from the premise of Zero Waste in itself being an explicit and recognised utopia. Interviewees also considered zero waste a goal in itself. As a consequence, the code of zero waste as a utopia was also left unaltered. Although it was found that the other existing codes were

sometimes too distinct to be useful. It was found that some of the goals forwarded by the interviewees could be considered both economic and social benefits i.e. the creation of jobs. Similarly it was difficult to ascertain where environmental benefits and economic benefits of resource conservation stopped. Nevertheless the codes were kept separate to allow attention to be paid to those utopias that were more distinct.

Figure 11: Utopia Codes
Zero Waste
Environment
Society
Economy

Appendix 5: Table of Documents for Analysis

Documents shaded in Grey are National Strategy Documents

	Document Name	Date	Author	Description
1.	Planning Advice Note 63:	Feb 2002	Crown Office	Advice on good practice for waste infrastructure planning applications
2.	National Waste Action Plan	2003	Scottish Government	National Waste Plan (superseded by the Zero Waste Plan – Document 19)
3.	SPP10 Planning for Waste Management	Aug 2007	Scottish Executive	Statement of Scottish Executive policy on land-use for waste management (superseded by National Planning Framework 2- Document 13)
4.	Better Waste Regulation Consultation Report	2007	SEPA Government	Summary of views on current waste regulations and potential improvements
5.	A Burning Issue: Energy from Waste in Scotland	Dec 2007	SDC	Report on the potential benefits and challenges of EFW in Scotland
6.	Better Waste Regulation Action Programme	Aug 2008	SEPA, Scottish Government	Action Plan in Response to Consultation (Document 4)
7.	DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL On Waste	Nov 2008	EC	The Legislative Framework for Handling Waste in the EU.
Zero Waste Think Tank Documents				
8.	Zero Waste Think Tank Minutes	2008	Scottish Government	Papers and Minutes from Zero Waste Think Tank Meetings
9.	Sub-group Report on Business Resource Efficiency	2009	Zero Waste Think Tank	Drivers for Resource Efficiency in Scotland
10.	Sub-group Report on Waste, Carbon,	2009	Zero Waste Think Tank	Policy recommendations on resource

	Resource and Energy Interactions			conservation, energy and carbon reductions
11.	Sub Group Report pm Delivery	2009	Zero Waste Think Tank	Revision of National Waste Plan and subsequent amendments to deliver Scottish Government objectives by 2020
12.	Zero Waste Think Tank Summary Report	2009	Zero Waste Think Tank	Summary Report of Think Tank Findings
13.	National Planning Framework For Scotland 2	2009	Scottish Government	National Planning Framework setting out spatial strategy for Scotland for the next 20 years
14.	Reducing Waste Through Promoting Product Ecodesign: A Discussion Paper	2009	Scottish Government Environmental Social Research	Discussion paper and report for eco-design and waste opportunities in Scotland
15.	SEPA's Thermal treatment of waste guidelines	2009	SEPA Scottish Government	Guidelines for developers and planners on the criteria for suitable energy from waste infrastructure
16.	Zero Waste Plan Household Leaflet	Aug 2009	Scottish Government	Brief Advice Leaflet for Households
17.	Scotland's Zero Waste Plan: Consultation	Aug 2009	Scottish Government	Consultation on the Draft Zero Waste Plan
18.	Zero Waste Plan Consultation: Quantitative Analysis Report	Dec 2009	Scottish Government	Synergy Report on the Consultation Responses on the Draft Zero Waste Plan
19.	Zero Waste Scotland Plan	June 2010	Scottish Government	The National Strategy for Zero Waste
20.	Scotland's Zero Waste Plan; Post-Adoption Strategic Environmental Assessment Statement	July 2010	Scottish Government	The Strategic Environmental Assessment (a statutory requirement) of the Zero Waste Plan (Document 19)
21.	Zero Waste Scotland Programme Plan 2012-2015	2011	Zero Waste Scotland	Organisational plan for Zero Waste Scotland
22.	State of the Sector Report	2011	CRNS/Zero Waste Scotland	A study into the activities of Scottish third sector re-use and recycling organisations

23.	Zero Waste Plan – Guidance for Local Authorities	June 2011	SEPA	Guidance for Local Authorities on Data Collection Requirements for the Plan
24.	Roadmap to a Resource Efficient Europe	Sept 2011	EC	Roadmap setting out plan for a resource efficient Europe with sustainable economic growth
25.	Waste to Resource: Pathway to Zero Waste	2012	Scottish Environmental Services Association	Set out the waste industries interpretation of the Zero Waste Plan and produces their own objectives
26.	The Waste Scotland (2012) Regulations Briefing	March 2012	Scottish Parliament Information Centre (SPICe)	Summarises responses and sets out terms of new waste regulations
27.	North Lanarkshire Council v The Scottish Ministers and Shore Energy [2013] CSIH 58	June 2013	Court of Session	Scottish Court Judgement in the first case to consider the Zero Waste Policy.
28.	Safeguarding Scotland's Resources: Blueprint for a more resource efficient and circular economy	Oct 2013	Scottish Government	Programme introducing the Circular Economy to encourage sustainable resource use. Forms part of the Zero Waste Plan (Document 19)

Appendix 6: Summary of Research Findings

Title: A Resourceful Aspiration: Understanding the Governmentality of Zero Waste in Scotland

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This document is a short summary of the background to the project, the aims, research methods and strategy, and key findings of the research behind the thesis: *A Resourceful Aspiration: Understanding the Governmentality of Zero Waste in Scotland*. The summary is intended as a debrief for interviewees and other interested parties. Full copies of the thesis can be obtained by emailing the researcher.

Background

The project was developed for two reasons: to develop socio-political understandings of waste policy in Scotland and to contribute to existing academic knowledge on the concept of Zero Waste.

Waste policy is notoriously complex, involving many actors using different techniques across scales. There are no written sources through which to make sense of this complex landscape in Scotland. In contrast to many other developed nations (England, Ireland, EU Countries, New Zealand) there are no published studies on waste governance in Scotland. The lack of existing research on Scotland has two consequences, firstly it limits potentially beneficial academic engagement with waste sector in Scotland and secondly, it fails to share with global waste researchers insights into Zero Waste as a national policy concept.

The concept of Zero Waste is also under-researched within academia. A number of researchers have identified the potential of the idea of Zero Waste to provide innovative solutions to waste management, however, most research has focused on Zero Waste policies in individual products, organisations or cities. The Scottish policy of Zero Waste offers an interesting case study to enhance academic understanding of sustainable governance of waste at a national scale.

Project Theory

To understand *how* zero waste was governed in Scotland, the project used the concept of governmentality. Governmentality is a theory that suggests a number of factors contribute to shaping governing choices, not all of which are immediately apparent. From a governmentality perspective, actions of governing are often underpinned by unspoken rationales about how society should be governed. This project used governmentality to investigate whether the rationale behind the Zero Waste policy are in line with the governmentality considered relevant for sustainable development.

Project Aims

The project had 3 aims:

- 1) To develop an understanding of Zero Waste policy in Scotland
- 2) To critically assess the rationale behind the Zero Waste policy in Scotland in relation to the governmentality for Sustainable Development
- 3) To investigate the concept of ‘governmentality’ as a framing through which to make sense of the governance of Zero Waste in Scotland

Research Methods & Analysis Strategy

The research data was taken from 30 semi-structured interviews with experts in Zero Waste policy. Interviewees represented government (local and national), industry, community organisations, the media, academia and the legal sector. To retain anonymity, opinions of interviewees were not referenced directly.

The information from the interviewees was supplemented with data from policy documents spanning the period 2002- 2012. These documents were chosen for their direct relevance to the ZW Policy (i.e. National Plans, ZW Think Tank Reports) or because they were referenced by interviewees.

The data was analysed through a Framework for Analysis (see Figure 1). This Framework for Analysis was designed with the aim of identifying the underlying rationale for the actions undertaken to achieve the Zero Waste policy goals.

Figure 1: Framework for Analysis		
Element of Analysis	Description	Examples
Problematisation	How is Zero Waste presented problem requiring governing?	Public Health, Public Nuisance, Economic Development, Environmental Pollution, Resource Conservation, Criminality
Visibility	How is Zero Waste made visible through governing?	i.e. Waste management infrastructure, local authority waste plans, policy targets, waste industry
Techniques	What means are used to govern Zero Waste?	i.e. policy documents, policy initiatives, legislation, funding
Knowledge	What knowledge is required for Zero Waste?	i.e. measuring waste, areas of expertise in zero waste, future research requirements
Identity	Who is responsible for governing Zero Waste?	i.e. Local Authorities, industry experts, producers, householders, Zero Waste Scotland
Utopia	What does a Zero Waste society look like?	i.e. types of infrastructure, new institutions,

Project Findings

Insight into Zero Waste as a national policy:

- Zero waste in Scotland has come to be identified with particular government targets but it also widely recognised as a new philosophy of resource use.
- Targets were considered the most visible but not the most important aspect of the Zero Waste goal, in part because they focused heavily on recycling.
- It is widely recognised in the policy sector that achieving the targets and adopting the new philosophy will require a rethink of waste governance in Scotland.
- Particular importance was placed upon widening the scope of waste governance to ensure that the policy covers all waste streams, considered all points in the production and consumption process, involved all of Scottish society and linked cross policy.
- It was recognised that the Zero Waste policy had these aspirations but some thought it was failing in implementation, citing the strategy as piecemeal and confusing. Others identified that current institutions in Scotland (particularly planning) were incompatible with the requirements for a broad Zero Waste policy.

Identification of the rationales behind Zero Waste Policy:

- As the academic theory would predict, a number of different rationales were identified within the Zero Waste policy.
- It was found that there was evidence of the policy exhibiting the rationale of governing 'waste as a resource' in contrast to 'waste as disposal' which suggested the Zero Waste policy was linked to sustainable development rationales for governance.
- The Zero Waste policy was also linked to neo-liberal governance goals including expansion of the market; creation of a global circular economy; and encouragement of individual responsibility for waste.
- The thesis found that although elements of sustainable development rationales for governance were present, these were often overshadowed by other governmentalities. This overshadowing was particularly found in relation to the types of knowledge required to develop the Zero Waste Policy where waste expertise and technical knowledge was given precedence over discussions of societal values and civic engagement.

Project Conclusions and Recommendations

The thesis concluded that if the Zero Waste policy is to come more in line with the type of governmentality thought necessary for sustainable development then it must utilise different perspectives on waste within policy-making. This reflects existing scholarship which suggests that waste research too readily focuses on the technical and material aspects of disposal, ignoring the socio-political aspects of managing waste.

The thesis makes three recommendations which would invite and encourage different perspectives on waste in Scotland:

- 1) Expanding discussions of the vision of a Zero Waste society into wider society
- 2) Encouraging research collaborations between technical waste experts and social scientists
- 3) Developing spaces for open discussion of the issue of waste in Scotland, potentially through educational institutions.